

**AN EXAMINATION OF THE ROLE OF
ADVERTISING CONTENT IN THE RELATIONSHIP
BETWEEN ALCOHOL ADVERTISING EXPOSURE
AND UNDERAGE DRINKING**

by
Alisa A. Padon, MBE

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ABSTRACT

Background

Young people's exposure to alcohol marketing is a major public health issue, given its potential impact on drinking behaviors. Young people are spending significant amounts of time watching television, and alcohol marketing and promotion on TV is increasing. Little information exists on the presence of youth-appelling content in U.S. televised alcohol advertisements, and whether this is associated with youth drinking behaviors.

Objectives

The objectives of this research are to (1) determine the extent to which youth-appelling content is found in televised alcohol advertising, (2) test the influence of content on youth consumption, and (3) test the joint influence of exposure and content on youth consumption.

Methods

Descriptive and univariate data from a content analysis of 96 televised alcohol ads selected from among both popular and unpopular alcohol brands among youth were analyzed for the presence of primarily youthful content appeal (PYCA). Mean brand PYCA scores' association with youth consumption and adult consumption of each brand, as well as PYCA scores' association with youth consumption relative to adult consumption were tested through bivariate and multivariate linear regression. Associations of content and youth consumption by subgroup (popular versus unpopular brands) were also tested. A measure of brand exposure calculated using *adstock* was added as a predictor and the multiplicative influence of exposure and content on youth consumption was tested through bivariate and multivariate linear regression by brand subgroup.

Results

Primarily youthful content appeal was present in many of the televised ads and popular brands had a higher mean PYCA score ($M=2.7$, $SD=10.16$) than unpopular brands ($M=-2.72$, $SD=9.93$), $t(94) = -2.61$, $p < .05$. There was a positive association between brand PYCA score and brand consumption among youth ($\beta=.15$, $p < .001$) controlling for adult consumption, alcohol type and popularity, and a negative association between brand PYCA score and adult consumption ($\beta=-.15$, $p < .001$) controlling for youth consumption, alcohol type and popularity.

Separating by brand popularity, the association between brand PYCA score and youth consumption was present only among the popular brands ($\beta=.33$, $p < .001$), and the association between brand PYCA score and relative youth-to-adult consumption was only present among the popular brands ($\beta=.68$, $p < .001$).

Among popular brands, brand exposure score was negatively associated with youth consumption ($\beta=-.14$, $p < .001$), and there was no interaction effect of brand PYCA score on the association. There was a main effect of brand PYCA score on youth consumption ($\beta=.33$, $p < .001$) controlling for brand exposure and

adult consumption. Among unpopular brands, in the bivariate model brand exposure was positively associated with youth consumption ($\beta=.39$, $p < .01$), and there was a significant interaction effect of brand PYCA score such that higher mean PYCA score strengthened the positive effect of brand exposure.

Conclusions

Reducing the influence of alcohol advertising on underage drinking requires that researchers, public health practitioners and policy makers augment their focus on exposure with a serious consideration of advertising content. Youth are not passive viewers of advertising, and an effective approach to regulation of alcohol advertising requires stronger provisions regarding content.

COMMITTEE OF FINAL THESIS READERS

Committee Members:

Rajiv N. Rimal, PhD (Advisor)
Professor & Chair
Department of Prevention & Community Health
George Washington University

David H. Jernigan, PhD
Associate Professor
Department of Health, Behavior & Society
Director, Center on Alcohol Marketing and Youth
Johns Hopkins Bloomberg School of Public Health

David D. Celentano, ScD
Professor & Charles Armstrong Chair
Department of Epidemiology
Johns Hopkins Bloomberg School of Public Health

Sara B. Johnson, PhD
Assistant Professor
Department of Population, Family and Reproductive Health
Johns Hopkins Bloomberg School of Public Health

Alternate Committee Members:

Rosa Crum, MD
Professor
Department of Mental Health
Johns Hopkins Bloomberg School of Public Health

Debra Roter, DrPH
Professor
Department of Health, Behavior & Society
Johns Hopkins Bloomberg School of Public Health

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Chapter One: Introduction

Underage drinking is a serious public health problem in the U.S. (Eaton et al., 2012; Newes-Adeyi, Chen, Williams & Faden, 2005; USDHHS, 2007). By age 15, more than half of teens nationwide have tried alcohol, and by age 18 that number has risen to 79% (Eaton et al. 2012). Nearly 30% of underage Americans (age 12 to 20) reported drinking in the past 30 days (Johnston, O'Malley, Bachman and Schulenberg, 2012; SAMHSA, 2010), and 42% of high school seniors reported binge drinking in the last 30 days (Johnston et al., 2012). Nearly 1 million youth under age 15 initiate alcohol use every year (Johnston, O'Malley, Bachman and Schulenberg, 2009), making them 4 times more likely to become alcohol dependent later in life, seven times more likely to be involved in an alcohol-related incident, and 10 times more likely to experience alcohol-related violence in their lives (Grant & Dawson, 1997; Hingson, Heeren, Jamanka & Howland, 2001; McNeely & Blanchard, 2009; Swahn, Bossarte & Sullivent, 2008).

Youth are particularly vulnerable to alcohol-related harms due to their unique developmental stage and propensity to engage in risky behaviors (Tillet, 2005). Alcohol is a major contributing factor in youth morbidity and mortality, responsible for 4,300 youth deaths annually from vehicle crashes, homicides, suicides and other injuries (Centers for Disease Control and Prevention, 2013). Heavy drinking during adolescence has been shown to have negative effects on neuropsychological functioning and to result in abnormal brain structure development (Tapert, Caldwell & Burke, retrieved February 10, 2013).

Excessive drinking among underage youth is estimated to cost society \$24.6 billion annually, a figure that includes lost productivity, health care costs

from hospitalization, drugs and services, prevention and research costs and other effects including criminal justice, property damage, and motor vehicle crashes (Bouchery, Harwood, Sacks, Simon and Brewer, 2011).

There have been many factors proposed to be driving youth's drinking patterns but one that has risen to the forefront is youth exposure to alcohol marketing (Center on Alcohol Marketing and Youth (CAMY), 2007). In 2005, alcohol industry expenditures in advertising and promotion reached over \$3.1 billion, a 150% increase from 1998 (Competitive Media Reporting, 1998). Almost a billion of that was allocated to television advertising, the most dominant medium in the U.S. in terms of availability and accessibility (CAMY, 2007; Competitive Media Reporting, 1998).

Though the alcohol industry volunteers to limit ad placement to television shows in which less than 28.4% of the national audience is under age 21 (Beer Institute, 2011; Distilled Spirits Council of the U.S. (DISCUS), 2011; Wine Institute, 2011), research has found that much televised alcohol advertising appears on channels and programs with audiences disproportionately consisting of youth (CAMY, 2007; Centers for Disease Control (CDC), 2013; Evans, Marcus & Engle, 2008). CAMY (2012) found a 71% increase in youth exposure to alcohol advertising between 2001 and 2009, culminating in youth seeing, on average, one alcohol ad per day on television in 2009.

Research studies on the influence of youth exposure to alcohol advertising on underage drinking have found mixed results (Anderson, de Bruijn, Angus, Gordon and Hastings, 2009; Nelson, 2011; Saffer, 2002; Smith & Foxcroft,

2009), and remarkably little is known about the underlying process that would explain how exposure to advertising might lead to consumption.

Advertisement content could be one of the missing factors in the equation. Media content is an influential force in shaping youths' perceptions and expectations around drinking, and youth who hold perceptions of drinkers as attractive and successful and who have positive expectancies around alcohol consumption may be predisposed to drinking (Cable & Sacker, 2008; Fisher, Miles, Austin, Camargo & Colditz, 2007; Goldman, Del Boca, & Darkes, 1999; Jones & Donovan, 2001; Leigh & Stacy, 2004; Patrick, Wray-Lake, Finlay & Maggs, 2009; Rimal & Real, 2005).

The alcohol industry self-limits the content it uses for marketing, stipulating that advertisement content cannot “primarily” appeal to youth (Beer Institute, 2011; DISCUS, 2011; Wine Institute, 2011), but guidance on what constitutes primarily youth appealing content is limited and subjective (Health & Human Services, 1991; Babor, Xuan and Damon, 2010). On the grounds that content is as appealing to adults as to youth, marketers are given free reign to use content known to be youth-appealing.

In this project, I examine a missing piece in our understanding of why youth drink: the content of alcohol advertisements. This has far reaching implications for public health, including strengthening policy initiatives for regulating the content of alcohol advertisements shown during television shows with large youth audiences.

In three parts, this project investigates the construct and presence of *youth appeal* in brand-specific media content, delineating between alcohol

advertising content that is primarily youth-appealing versus adult-appealing. In part I, I explore discrepancies between the content that the research literature says is youth-appealing compared to content the alcohol industry says is appealing to youth. I present the results of an analysis of the presence of these youth-appealing content elements in a sample of advertisements aired on TV shows youth are highly exposed to in the U.S. In part II, I examine the validity of the industry's interpretation of "primarily" youth-appealing content by testing the differential association between brands' primarily youthful content appeal (PYCA) and alcohol consumption patterns of youth and adults. In part III, I examine the relationship between youth exposure to brand advertising and youth consumption patterns, and test whether the presence of PYCA in ads strengthens the relationship between exposure and consumption.

Chapter Two: Literature Review

The Underage Drinking Problem

Underage alcohol consumption is a serious problem in the U.S. (Eaton et al., 2012; Newes-Adeyi, Chen, Williams & Faden, 2005; USDHHS, 2007). According to the National Survey on Drug Use and Health, nearly 30% of underage Americans (age 12 to 20) reported drinking in the past 30 days (Johnston, O'Malley, Bachman and Schulenberg, 2012; SAMHSA, 2010), and nearly 1 million more youth under age 15 initiate alcohol use every year (Johnston, O'Malley, Bachman and Schulenberg, 2009), making them more likely to become alcohol dependent later in life than youth who start at age 21 (Grant & Dawson, 1997; Hingson et al., 2001; McNeely & Blanchard, 2009; Swahn, Bossarte & Sullivent, 2008).

In the United States, rates of females drinking are catching up to those of males, and binge drinking remains high among college aged youth (Johnston, O'Malley, Bachman and Schulenberg, 2009). Drinking during adolescence is particularly troubling as adolescents already are more likely to engage in risky behaviors (Tillet, 2005) and adding alcohol to the mix means an increase in impulsive decision-making, preventable injuries, higher rates of sexually transmitted infections and sexual assault (Champion et al., 2004; Cook and Duncan, 2005; Peterson, Hawkins, Abbott & Catalano, 1995).

Alcohol-related incidents such as vehicle crashes, homicides, suicides and other unintentional injuries are responsible for over 4,300 youth deaths annually (CDC, 2013), and alcohol can have a potentially permanent, negative effect on young adults' developing brains (FTC, 1999; NIAAA, 2004/2005; USDHHS, 2007). Specifically, heavy drinking during adolescence has been shown to have

negative effects on neuropsychological functioning and to result in abnormal brain structure development (Tapert, Caldwell & Burke, retrieved February 10, 2013). Excessive drinking among underage youth is estimated to cost society \$24.6 billion annually, a figure that includes lost productivity, health care costs from hospitalization, drugs and services, prevention and research costs and other effects including criminal justice, property damage, and motor vehicle crashes (Bouchery, Harwood, Sacks, Simon and Brewer, 2011).

Youth Exposure to Alcohol Advertising

Youth exposure to alcohol advertisements and promotions has been posited as an influential factor in underage alcohol consumption (Anderson, de Bruijn, Angus, Gordon & Hastings, 2009; Atkinson, Elliot, Bellis & Sumnall, 2011; Austin and Knaus, 2000; Center on Alcohol Marketing and Youth (CAMY), 2007; Chung et al., 2010; Ellickson, Collins, Hambarsoomians & McCaffrey, 2005; Nicholls, 2012; Smith and Foxcroft, 2009; Tanski, McClure, Jernigan & Sargent, 2011). In 2005, alcohol industry expenditures in advertising and promotion reached over \$3.1 billion, a 150% increase from 1998 (Competitive Media Reporting, 1998), with almost a billion of that allocated to television advertising.

Television has been the most dominant medium in the U.S. in terms of availability and accessibility (CAMY, 2007), with 94% of youth reporting watching TV in the last week for 10 hours a week on average (Kaiser Family Foundation, 2010). Much of televised alcohol advertising appears on channels and programs with audiences disproportionately consisting of youth (Evans, Marcus & Engle, 2008).

Ad placement on TV is entirely industry self-regulated, and the alcohol industry volunteers to limit ad placement according to audience composition. Currently, alcohol ads are only allowed on television shows in which less than 28.4% of the national audience is under age 21 (DISCUS, 2011; Beer Institute, 2011), but recent reports have suggested this rule requires revision. The 28.4% threshold is based on census data of the national population of youth aged 2-20. However, given that few youth aged 2-11 are part of the population at risk for underage drinking, the National Research Council and Institute of Medicine suggested that only viewers aged 12-20 should be factored into the threshold. They proposed that alcohol ad placement be limited to TV shows in which less than 15% of the viewing audience is aged 12-20 (2004).

One study found that 7.5% of all alcohol ads aired in 2009 were placed on programming with youth audiences exceeding a 30% threshold (CAMY, 2012), and a recent CDC report found in an examination of the audience breakdown locally, rather than nationally, almost 24% of alcohol ad placements on the top 10 most popular TV programs among youth violate the audience threshold (2013).

Research on youth and marketing exposure finds that this is creating a media environment with potential for high youth exposure to alcohol advertising. Between 2001 and 2009 CAMY (2012) found a 71% increase in youth exposure to alcohol advertising, most of it during television programming with a higher likelihood of a youth audience than an adult audience. This meant that in 2009, youth saw one alcohol ad per day on television. CAMY also found that adolescents were 22 times more likely to be exposed to an alcohol advertisement than a responsibility ad that advocates for safe drinking practices (2012).

The Link Between Exposure and Consumption

Evidence of high youth exposure to alcohol marketing has generated much interest among alcohol researchers in the link between exposure and underage drinking, however findings are mixed on whether and how a causal association exists (Engels, Hermans, van Baaren, Hollenstein & Bot, 2009; Fisher, 1993; Nelson, 1999). In a review article, Saffer (2002) critiques econometric studies of alcohol consumption showing no effect of high exposure to advertising on youth consumption. A report by the International Center for Alcohol Policy to the World Health Organization (2003) concluded that the evidence to support an association between advertising and youth consumption is insufficient. Similarly, Nelson (2011) conducted a meta-analysis of 21 longitudinal studies and found many primary studies' results to be inconclusive and the literature as a whole to suffer from publication bias.

On the other side, in a systematic review of 7 longitudinal studies, Smith and Foxcroft (2009) found exposure to advertisements led to drinking initiation but showed no difference among those youth who had already initiated drinking. One of these longitudinal studies showed a positive correlation between the frequency and amount of alcohol consumed and the number of ads recalled by youth (Connolly, Casswell, Zhang & Silva, 1994) and another found that alcohol consumption at a one-year follow-up was positively correlated with number of hours spent watching television regardless of baseline drinking (Stacy, Zogg, Unger & Dent, 2004). Snyder et al. (2006) found a 1% increase in number of drinks consumed for each additional advertisement a teen viewed, and a 3% increase in drinks consumed per dollar spent on advertising. Anderson et al.

(2009) conducted a systematic review of 13 longitudinal studies (some overlapping with Smith and Foxcroft) and concluded there is a relationship between exposure and consumption via increases in both drinking initiation and increased frequency and quantity of consumption among baseline drinkers.

There are limitations to the studies falling on both sides. Much of the research utilizes self-reported exposure to advertisements, which suffers from recall bias, and while more longitudinal studies are being conducted, the majority uses a cross-sectional design from which causal direction of the association cannot be known. Many of the studies have tested for a linear relationship between exposure and consumption, but other research has indicated the association is nonlinear (Ackoff and Emshoff, 1975; Wind and Sharp, 2009). Clearly the suggestion of a link is there, but it seems that some crucial moderating factor(s) are being ignored.

The Theory of Content Appeal

Theory suggests one such moderating factor is media content. Media content is an influential source in shaping our perceptions and expectations around certain behaviors, and research has found that youth who hold perceptions of drinkers as attractive and successful and who have positive expectancies around alcohol consumption may be predisposed to drinking (Cable & Sacker, 2008; Fisher, Miles, Austin, Camargo & Colditz, 2007; Goldman, Del Boca, & Darkes, 1999; Jones & Donovan, 2001; Leigh & Stacy, 2004; Patrick, Wray-Lake, Finlay & Maggs, 2009; Rimal & Real, 2005).

Albert Bandura's social cognitive theory (SCT) is most often used in studies relating the role of media to behaviors (Hansen, 1986), and asserts that

watching others, both in life and in the media, is a part of a process of “informing, modeling, motivating, and guiding personal changes” (Bandura, 2004, p. 150). This is a typically protective trait as individuals can observe those behaviors that are successful and those that are not prior to doing them, but media can capitalize on these modeling tendencies by projecting a ubiquitous, tailored version of the world with characters one aspires to be like consuming alcohol brands the industry wants to sell (Baillie, 1996).

Modeling has been shown to be especially likely when the behaviors observed are framed in positive ways, as was indicated in studies on televised violence and aggression in children. Exposure to violence alone inconsistently led to aggression, but when violence was shown to be rewarded it prompted imitation by children (Bandura, 1986; Comstock and Paik, 1991). Exposure to advertising correlates with positive expectancies and beliefs among youth about alcohol use, such as that alcohol use is part of a fulfilling lifestyle and leads to happiness, fun and social acceptance (Casswell, 1995, Fleming, Thorson & Atkin, 2004; Jones and Donovan, 2001; Sargent, Wills, Stoolmiller, Gibson & Gibbons, 2006; Wills, Sargent, Gibbons, Gerrard & Stoolmiller, 2009).

Imitation is also more likely when the model is seen as attractive and of high status (Austin & Hust, 2005; Grube, 1995). Ads featuring good-looking, successful celebrities or models are highly rated in terms of likeability by youth and are effective at increasing youth’s desire to purchase the product (Chen et al. 2005). The viewer perceiving similarities with the actor or ad setting can also lead to modeling, as when a portrayed norm conforms to viewers’ personal norms, it increases message acceptance (Austin & Meili, 1994).

Repeatedly exposing the viewer to the same media messages can increase the likelihood that the viewer believes the message and will model the behaviors. Frequent viewing of stimulating televised content is theorized to result in easy recall of these vivid TV memories, which are then perceived by the brain as occurring more frequently (Tversky & Kahneman, 1973). The memories from TV bleed into memories of the real world and are assumed to be true (Shrum, 1996). Repeated exposure results in an accumulation of these effects (Broadbent, 2000).

This is consistent with cultivation theory, which suggests that our heavy consumption of media has created a population of viewers whose social reality is constructed from television (Gerbner, Gross, Morgan & Signorielli, 1994). Cultivation theory focuses specifically on television, in part because it has been the most dominant media vehicle in the U.S. but also because televised content is exceedingly homogenous, with most media ownership monopolized by just a few corporations (USTelevision.com, 2011). Audiences are exposed repeatedly to similar mass-produced messages, and according to cultivation theory, this results in an audience whose social reality is largely constructed from what is viewed on TV (Gerbner, 1998). Cultivation theory does not assume a unidirectional influence, however, but rather an interaction between media and the public. While the public sphere reflects the media, the media created is drawn from the public sphere in a perpetual feedback loop (Gerbner, 1998).

Cultivation theory incorporates a dose-response mechanism, whereby the amount of television watched is positively correlated with the degree to which a viewer will perceive his world as mirroring the televised world. Heavier viewers will be more influenced by TV in their decision-making than lighter viewers

(Gerbner, Gross, Morgan & Signorielli, 1986). Consequently, through the feedback process that creates media and influences viewers, heavy viewers regress to the mean and become more homogenous themselves. This is a process termed “mainstreaming”, and research shows most viewers are unaware of its happening; they do not see that their opinions and beliefs are changing to match what is espoused in the media. This may be especially pronounced in those viewers whose actual lives are very similar to televised lives, a specific type of developing homogeneity termed “resonance” (Gerbner, 1998).

Cultivation theory can be criticized for its characterization of the viewer as a largely passive, unconscious consumer of media messages, given findings that suggest that audience acceptance of a message is a function of viewer interest and agency (Lang, 2000). Cultivation theory is also shortsighted in the linear trend that accumulation implies, as overexposure can result in audience saturation after which advertising effects may diminish (Ackoff & Emshoff, 1975). However, taken together, social cognitive theory and cultivation theory emphasize the importance of both message meaning and the ubiquity of advertising in shaping consumer behaviors. A look at specific appeals that are persuasive to youth and the extent of their presence in media today provides a practical application for the marriage of these theories.

Primarily Youthful Content Appeal

Using experiments on youth-oriented marketing across media and products, scholars (Aitken et al. 1988; Aitken, 1989; Belstock, Donnelly, Carpenter & Donovan, 2001; Craig, 1992; Fielder, Donovan & Ouschan, 2009; Fogarty & Chapman, 2012; Jones, Phillipson & Barrie, 2010; Lewis & Hill, 1998;

Nash, Pine & Messer, 2009; Niederdeppe, Davis, Farrelly & Yarsevich, 2007; Rhoades & Jernigan, 2012; Sloane, Wilson & Gunasekara, 2012; Waiters, Treno & Grube, 2001) in the field have identified many content elements that are appealing to youth. Below is a summary of the literature specific to youth-oriented alcohol marketing across media, along with some findings from youth-oriented food and tobacco marketing. This research has focused on six broad categories of youth-appealing content: 1) production value, 2) character appeal, 3) youth-oriented theme 4) product appeals, 5) emotional appeals and 6) risky content.

Production Value. Production value refers to certain stylistic features of an advertisement that have been shown to enhance ad recall through cognitive stimulation. Based on the activation model of information exposure (AMIE) and the limited capacity model (LCM), introducing structural features to an advertisement leads to an “orienting response” in the viewer, an involuntary, high level of attention paid to the stimuli (Lang, 2000; Lang, Zhou, Schwartz, Bolls & Potter, 2000; Niederdeppe et al. 2007). Inclusion of such structural features results in message processing, higher ad recall and more positive attitudes toward the product (Donohew, Lorch & Palmgreen, 1998) as long as the overall cognitive demand is not too high (Lang, 2000). Specific, stimulating production features include:

- Animation is appealing due to its distinct visual style, and appealing specifically to younger youth due to its association with cartoons (Nash, et al. 2009).

- Intense images are those that are graphic or disgusting and that capture attention and promote recall through eliciting an emotional response (Niederdeppe et al. 2007).
- Sound saturation is background noise like a busy street or a crowd that makes the ad seem more realistic and increases the likelihood that the viewer believes the ad messages (Morgan, Palmgreen, Stephenson, Hoyle & Lorch, 2003).
- The use of loud and fast music increases the sensation value of an ad by distinguishing it from bordering ads or programs (Morgan et al. 2003).
- Second-half punch (a surprising ending) and other surprising elements in a message similarly evoke emotional responses, and are rated by youth as having high perceived sensation value, that teens in particular are known to seek out (Niederdeppe et al. 2007).
- Related edits (a transition to a new camera shot in the same environment) and unrelated edits (a transition to a new physical environment) have the potential to engage viewers through the novel visual information of a new physical scene (Niederdeppe et al. 2007).
- Ad pace is a measure of the total number of edits divided by ad duration. The faster the pace of an ad, contingent on the ad not requiring great cognitive resources, the greater the memory activation and the greater the physiological arousal, which increases liking for the ad (Lang, 2000; Niederdeppe et al. 2007). Research has defined a slow paced ad as one having 0-7 edits/minute, a medium paced ad has

between 8 and 15 edits, a fast paced ad has between 16 and 23 and a very fast paced ad has 24+ edits/minute (Lang et al. 2000).

Character Appeal. Character appeal captures the characteristics of the main and additional actors from the advertisement. Perceiving similarity with an ad model through gender, racial or age concordance is a means to activate audience identification or aspiration through modeling (Bandura, 1986), and youth identifying with similar actors depicting drinking norms could easily come to adopt those norms and model what they view in their own peer networks. A number of studies have shown that use of animated characters, celebrities, animals and youth actors leads to higher attention and positive emotional response among youth toward the advertised product (Chen et al. 2005; Lewis & Hill, 1998; Nash et al. 2009; Waiters et al. 2001).

Animals and anthropomorphized creatures or products, which may be given eyes or a voice and shaped into a more humanlike form, are associated with child-targeted media and ads featuring these characters are rated highly by youth on likeability (Nash et al. 2009).

As theorized by SCT, ads featuring attractive, successful celebrities or models are highly rated by youth (Chen et al. 2005). Teens, particularly females with low self-esteem, are more likely to report liking a brand that uses glamorous, successful actors and trusting the ad (Boush, Friestad, & Rose, 1994; Martin, Gentry, & Hill, 1999). These young women may be identifying the beautiful, successful models as a referent group whom they aspire to be like and connect with, increasing the likelihood they will imitate the group's behaviors (Rimal & Real, 2005).

Theme. Theme defines the overarching genre of the advertisement, which, in the literature, includes magic, fantasy, violence, humor and story-telling format. These have been posited by message effects theory and shown by multiple studies to be predictive of youth liking of an ad and product (Aitken et al., 1988; Aitken, 1989; Chen et al. 2005; Lewis & Hill, 1998; Nash et al., 2009; Waiters et al., 2001).

Magic and fantasy, like animation, are associated by children with entertainment, toys and play (Lewis & Hill, 1998); violence, like intense images, captures attention through eliciting an emotional response and appeals more to older youth (Rajecki et al. 1994). Uses of humor and story are better received by youth than even use of music and animals (Chen et al. 2005).

Product Appeals. Product appeals tend to be used to trigger a rational, decision-making process in the audience based on product attributes such as taste, quality, health concerns and value, and are found to be rated less favorably among youth (Waiters et al. 2001).

Emotional Appeals. Emotional appeals are claims of compelling, rewarding, experiential outcomes associated with the product and are associated with more favorable ratings among youth (Chen et al. 2005; Lewis & Hill, 1998; Nash et al. 2009). Studies show that youth perceive even indirect associations between consumption and rewards (Jones & Donovan, 2001). Examples of emotional appeals include positive mood changes, camaraderie and high social positioning, achievement and individuality, physical performance improvement and promises of adventure, sex and romance.

Adolescents, for numerous reasons, experience greater negative affect than both children and older people, and studies have shown that when in distress, adolescents are more likely to make risky choices and to value short-term pleasures over longer-term harms in order to relieve this distress (Rice, Bratslavsky & Baumeister, 2001; Shiv & Fedorikhin, 1999, 2002; Whalen, Jamner, Henker & Delfino, 2001).

Animal studies have shown that during adolescence, the brain is especially sensitive to the rewarding effects of alcohol (Leslie et al. 2004; Philpot, Badanich & Kirstein, 2003). Many youth report expecting alcohol use to affect mood, such as inducing relaxation, happiness and disinhibition (Fleming et al, 2004). These expectancies play a role in shaping youth norms around alcohol and sociability. Teens are particularly preoccupied with their social standing and peer acceptance, experiencing higher levels of self-doubt and anxiety in social situations than adults (Pechmann et al. 2005). Youth are consequently highly receptive to suggestions that drinking will help them make friends and fit in (Pechmann et al. 2005), which could be indirectly contributing to expectations that alcohol use will reduce negative mood. Altogether, the promise of mood improvement and social success following consumption could cement the conversion from televised fantasy to real world belief and be highly valued by teens.

In a similar vein, youth are undergoing a process of self-discovery, and the association between alcohol use, personal achievements (social, professional, etc.), and the individuality offered through brand identities may be appealing to youth (Carr 2002; Smetana 1988).

Depictions of alcohol associated with physical performance improvement and adventure/spontaneity both appeal to youth's tendencies toward sensation seeking and impulsivity (Cauffman & Steinberg, 2000; Martin et al. 2002; Colder & Stice, 1998). Though the industry codes on good marketing practice require any depiction of physical activities requiring attention and coordination to occur prior to the depiction of consumption (DISCUS, 2011; Beer Institute, 2011), given teens' thrill-seeking behaviors this more responsible order of events is likely to be ignored. Sensation seeking tendencies also correlate strongly with pubescent stage (Martin et al. 2002), and for teens with strong sexual feelings, pairing sex and romance with alcohol use in ads must seem a compelling prospect (Pechmann et al. 2005), one that may be contributing to the statistics around alcohol use, sexually transmitted infections and unplanned pregnancy (Cooper, 2002).

Risky Content. Given teens' novelty- and sensation-seeking behaviors, media depictions of risky content are theorized to be appealing to youth (Finn & Strickland, 1982; Gardner and Steinberg, 2005; Giedd, 2008; Sargent, Wills, Stoolmiller, Gibson, & Gibbons, 2006; Rhoades & Jernigan, 2012).

Injury content is defined as depictions of dangerous activities requiring alertness and coordination (Rhoades & Jernigan, 2012). In line with the activation model of information exposure (AMIE), showing risky content such as alcohol paired with fast-paced, high-energy activities is attention-grabbing and can stimulate a physiological response in the viewer associated with liking (Finn & Strickland, 1982; Lang et al. 2000; Rhoades & Jernigan, 2012).

Overconsumption falls under risky content due to the increased likelihood of alcohol-related harms with binge or heavy drinking (Centers for Disease Control, 2012). An example of overconsumption in media includes showing more alcohol than seems reasonable for the number of actors. Studies on youth norms around drinking have found that the majority of students overestimate how much their peers drink (Borsari & Carey, 2003; Perkins, Meilman, Leichliter, Cashin & Presley, 1999; Perkins, 2003; Rimal & Real, 2005; Wechsler et al. 2002), a dangerous misperception to reinforce in the media given the strength of peer influence on teens. Adolescents tend to identify peers as their most significant role model (Brown 1990), and some researchers have theorized that media acts as a “superpeer” (Wills, Sargent, Gibbons, Gerrard, & Stoolmiller, 2010). In accordance with the theory of normative social behavior, viewing drinking patterns such as overconsumption in the media, especially if youth think that drinking pattern is both a prevalent behavior and that the behavior is expected of them, makes overconsumption likely to be adopted by youth as normative (Rimal & Real, 2005). Binge drinking rates have remained steadily high among college-age youth and have risen among females (Gruza, Norberg & Beirut, 2009). Among high-school aged youth who drink, binge drinking has been shown to be the most common pattern of drinking (Miller, Naimi, Brewer, & Jones, 2007), making depictions of overconsumption in the media a primary concern.

Last, addiction has been defined in the literature as depictions of drinking at inappropriate times of the day, citing excuses for drinking, and/or prolonged consumption (Rhoades & Jernigan, 2012). The portrayal of these messages may look similar to overconsumption, but at a deeper level they promise a carefree

experience to anxiety-ridden teens. Through the implication that one may not have control over his or her drinking, the pressure of responsible decision-making disappears.

Industry Guidelines

Though the literature on content that is youth appealing is extensive and research indicates youth have unique vulnerabilities to certain appeals, these content elements are largely not reflected in the alcohol industry's guidelines on marketing and youth. Advertising content is for the most part self-regulated by the alcohol industry, and both the Beer Institute and the Distilled Spirits Council of the U.S. (DISCUS) have a code of responsible practices for advertising and marketing.¹ These codes stipulate that if content is “primarily” appealing to youth it is unacceptable within the guidelines. What is primarily appealing, however, is unclear. The industry uses a circular definition, defining primarily appealing as content having: “special attractiveness to such persons beyond their general attractiveness for persons above the legal drinking age.” (DISCUS, p. 2, 2011; Beer Institute, p. 5, 2011).

The Beer Institute code (2011) provides 4 content-specific directives for brewers and marketers to follow: 1) consider symbols, language, music, gestures, entertainers/celebrities, cartoons and groups used, 2) omit depictions of Santa Claus, 3) restrict model ages to over 25 and appearance of over 21, and 4) prevent branded marketing on toys, games, clothes or other materials used primarily by underage youth. The DISCUS code (2011) provides 5 directives for marketers: 1)

¹There is also a Wine Institute code with similar guidance, but because wine has such a low youth prevalence of consumption the code is not detailed here.

no depictions of children or “objects, images or cartoon figures that primarily appeal to persons below the legal purchase age” (p. 5), 2) no depictions of Santa Claus, 3) no allusions to “rites of passage” to adulthood, 4) restrict model ages to over 25 and appearance of over 21, and 5) no branded marketing on toys, games, clothes or other materials used primarily by underage youth.

Both codes restrict certain content for general audiences around such messages as product representation, health claims, religion or religious themes, and social, professional, sexual or athletic success. The portrayal of activities requiring coordination or alertness during or after drinking is prohibited, as is lewd or indecent language or images, depictions of irresponsible drinking, illegal activities, degrading imagery, etc.

That the codes do not provide a sufficient definition of “primary” youth appeal and their content examples of primarily youthful content are narrow (i.e. Santa Claus) or subjective and largely open to interpretation (i.e. rites of passage) makes regulating appropriate content in alcohol advertising and promotions inconsistent and incomprehensive (Health & Human Services, 1991; Babor, Xuan and Damon, 2010).

Adhering to the guidance would ideally disallow the presence of messages and imagery that create positive youth expectations about drinking, but under the assumption that such messages and imagery may also appeal to adults they are allowed within the guidelines and content analyses, detailed below, have found frequent use of this content in various mediums.

Presence of Youthful Content Appeal in the Media

Through experiments and content analyses, scholars in the field have catalogued the types and extent of use of content appearing in alcohol marketing youth are exposed to across media:

Print Advertisements

There is a moderate body of research on the content of print alcohol advertisements. Strickland, Finn and Lambert (1982) analyzed 3131 magazine alcohol advertisements printed in 1979 and found that at the time the majority of advertisements were not using youth-appealing content. They used product-related themes, few included sexual connotation or self-reward and they found negligible levels of advertising in youth-oriented magazines.

By 2000, however, another content analysis found high use of sexual and social stereotypes and a ratio of 3:1 alcoholic to non-alcoholic beverage advertisements printed in the most popular magazines for youth (Austin and Hust, 2005). Rhoades and Jernigan (2012) examined alcohol ads in popular youth magazines such as Cosmopolitan, Vibe and Sports Illustrated and the ads' use of risky content. Risky content in their analysis included overconsumption, injury and implications of sexual success from drinking. Over 10% of their sample utilized such risky messages, the most common being sex-related imagery and objectification of women.

Radio Advertisements

Although there have been many research projects examining youth exposure to radio advertisements (Connolly et al. 1994; Smith & Foxcroft, 2009; Snyder, Milici, Sun & Strizhakova, 2006), very few have analyzed the content of the ads. In one experiment, Jones and Donovan (2001) had 87 youth (ages 15-16

and 19-21) listen to radio ads for a vodka-based premixed drink, and they found that most youth perceived strong associations between alcohol use and mood enhancement, being cool, feeling carefree, confident, and feeling less inhibited with the opposite sex.

Television Advertisements

Television is considered by the marketing field to be the most influential mode of marketing (Wind & Sharp, 2009). Readership of print is declining among youth (GfK MRI, 2011), and increases in digital media consumption have not resulted in a corresponding decrease in TV consumption (Wind & Sharp, 2009). Television has vastly more potential for message presentation than radio and print. It can establish narratives, set a mood through music and pace and present information. Yet even though TV is a major vehicle of influence there is a paucity of current research into the content of televised alcohol advertisements. Based on an analysis of 131 TV ads aired in the U.S., Finn and Strickland (1982) found high use of camaraderie themes (66%), relaxation themes (40.5%) and humor (38.2%). A recent study has shown little has changed in the intervening 20 years. Austin and Hust (2005) found 39% of TV ads aired in 2000 used camaraderie themes, 69% used relaxation themes and 62% used humor. The authors found high use of risky content on TV (37% of ads), and examined race and gender representation for the first time, finding higher but proportionate presence of Caucasian over minority actors to the national population and disproportionate presence of men over women. Men were present in nearly every ad whereas women appeared in half and in a third of those they were depicted as sex objects.

In an analysis of televised sporting events in the U.S., Madden and Grube (1994) found that alcohol advertisements made up 77% of all beverage commercials. Fifteen percent of these ads had celebrity endorsers, 37% showed risky activities and only 10% were product oriented. In a similar study of televised sporting events aired in Australia, Jones, Phillipson and Barrie (2010) found frequent use of celebrity endorsers, animal mascots, humor and sexual connotation. A follow-up focus group with 10-12 year old children showed kids liked and were able to recall the alcohol ads that used humor, music and mascots. In another Australian media-based analysis, Fielder, Donovan and Ouschan (2009) found that half of the 30 most youth-exposed TV alcohol advertisements of 2005 contained animals, half were humorous, 43% used a storytelling format and 33% had special effects.

Some researchers have explored perceptions of televised content through experimental models. Nash, Pine and Messer (2009) found that children (age 7-9) from the UK liked humorous alcohol ads over other ads, and liked cartoons, animals and similar looking people. They disliked product appeals. In a similar study, Chen et al. (2005) showed children most liked humorous ads, story-telling ads, ads with animals as leading characters and they disliked ads focusing on product quality.

Gaps in the literature. The literature shows that ads use elements known to influence youth perceptions of and expectations around drinking, but much is missing from this literature. First, by not comparing their influence with an adult audience, a clear understanding of “primary” youth appeal remains elusive. Second, much of this research comes from the previous decade or from other

countries where the ads and drinking culture may be very different from the U.S. today. Third, the literature on content and consumption has, to date, categorized alcohol by beer, liquor or wine, but marketers sell brands, not a type of alcohol. Aggregating all brands together by type may hide important patterns of consumption and marketing. Last, linking advertisement content with actual youth and adult drinking rates has never been done, and would be instructive in understanding the full picture of advertising's differential influence on youth behaviors. In order to determine the influence of current, U.S.-based alcohol marketing on youth, brand-specific consumption patterns among youth need to be examined (Bonnie & O'Connell, 2004).

What are youth drinking?

Most of the research literature on youth consumption of alcohol has focused on preferences by type. To date these studies have found that beer is the go-to beverage type among youth, but this trend seems to be changing (Johnston et al. 2009). Recent research suggests that youth are increasingly choosing beer and liquor with similar propensities (Siegel, Naimi, Cromeens, Nelson, 2011c). It is not clear what is driving this, but the change has occurred in the wake of the end of a voluntary ban on liquor advertising on TV. In 2001 there were less than 2,000 ads for liquor brands on TV; in 2009 there were over 62,000 (CAMY, 2010). It may be that liquor brands are incorporating more primarily youthful content elements into their ads, or that the same content elements in a liquor ad have a more persuasive effect than in a beer ad, driving differential consumption rates.

One of the first studies to comprehensively examine brand-specific alcohol

consumption among youth has dissected this trend on the brand level. The study was the Alcohol Brand Research Among Underage Drinkers (ABRAND) survey (Siegel et al. 2013), which asked youth (age 13-20) about their past 30-day consumption of 898 different brands of alcohol, categorized within 16 different alcoholic beverage types. Respondents then provided the frequency and amount of each brand consumed within the last 30 days. The survey was administered online using a pre-recruited Internet panel maintained by GfK (Palo Alto, CA) from December 2011 to May 2012 to 1,032 underage youth who had consumed at least 1 drink of alcohol in the past 30 days. The survey found that youth brand preferences were spread across a number of alcohol types, corroborating findings that youth are no longer mainly drinking beer. The survey also found that nearly half of all youth market share was concentrated among the top 25 brands consumed by youth (*see table 1.1*).

The only other brand-specific youth consumption study that could be found queried participants about their consumption patterns of just their favorite brands and found an association between high advertising expenditures and the favorite brands of heavy-drinking youth (Tanski et al. 2011).

What are adults drinking?

A crucial factor in understanding the relationship between advertising and underage drinking is the drinking pattern of adults. Youth might simply be copying the drinking behaviors of adults in which case marketing might not play a role, or may influence adults who then pass on their drinking preferences to teens. The alcohol industry stipulation that marketing cannot “primarily” appeal to youth (DISCUS, 2011; Beer Institute, 2011), means that as long as adult

drinking patterns are associated with advertising content, that content is at least equally appealing to adults as to youth and is therefore acceptable within the guidelines.

In a study by Gallup (2013), alcohol type preferences among adults (age 18+) deviate from youth in that beer is only marginally preferred over wine, with liquor falling in third. Breaking the patterns out by smaller age groups, the most popular alcohol type among drinkers age 18-29 is beer (41%) then liquor (28%) then wine (24%). These figures include youth age 18-20, however, so a resemblance is to be expected. These preferences shift as age increases. Among those aged 30-49, 43% prefer beer, 29% wine and 24% liquor, and among those age 50+, 46% prefer wine, 29% prefer beer and only 19% prefer liquor.

Until recently we have not had the data to compare youth and adult brand-specific preferences to test the assumption that youth are mimicking adults. A study recently submitted for publication compared adult and youth alcohol consumption patterns using the ABRAND survey and a survey by GfK MRI, the Survey of the American Consumer. The researchers found that while many of the popular youth brands were also popular among adults, patterns of drinking diverged. A greater proportion of youth were drinking a greater quantity of their preferred brands, and the brand preferences among adults were less concentrated (Siegel et al. 2014). More research is needed, but based on these preliminary analyses, youth do not seem to be simply copying the drinking behaviors of adults.

The alcohol industry maintains that its marketing and promotional activities are intended only to increase their market share – to convince adult

drinkers of legal purchase age or above to switch brands, and not to persuade underage youth or nondrinking adults to drink or current drinkers to drink more (International Center for Alcohol Policies, 2003). But the clear brand preferences among youth that Siegel et al. (2013) and Tanksi et al. (2011) found, the association with advertising expenditures, and the differential adult and youth drinking patterns suggest the need to examine what these popular youth brands may be doing differently in their marketing activities from the unpopular brands.

The task required of alcohol researchers is to test advertising content for differentiated appeal by underage youth and legal-age adults, starting with an examination of the content shown in the literature to be youth appealing that is currently allowed by the industry advertising guidelines. Media containing this content will be described hereafter as having primarily youthful content appeal (PYCA score).

Chapter Three: Study 1

Background

Analyzing the media messages in ad content, we can identify the expectations that are being communicated to the public, and in particular, to vulnerable youth (Schull, Kupersmidt and Erausquin, 2013). Previous content analyses on alcohol advertisements have shown the presence of specific content appealing to youth, however much of this research comes from the previous decade or from other countries where the ads and drinking culture may be very different from the U.S. today. The literature has not looked at the marketing practices by specific brands, and so has been largely unable to show differences in appeals used by brands youth like and drink most. These are omissions I attempt to address in study 1.

Research Questions

In this study, the construct of primarily youthful content appeal (PYCA score) in advertising is further explicated. A comprehensive list of the content elements found by previous research to be appealing to youth but that is not indicated by the industry guidelines to be prohibited was compiled, and makes up the PYCA score. PYCA score is then investigated in a sample of televised ads drawn from brands popular among youth and unpopular among youth. I raise the following research questions:

RQ1: To what extent are PYCA scores shown in the literature to be youth appealing used in alcohol advertisements?

RQ2: To what extent are there differences in PYCA scores by brand popularity and alcohol type?

RQ3: To what extent are PYCA scores defined by the alcohol industry to be youth appealing used in alcohol advertisements?

RQ4: To what extent are there differences in the use of PYCA elements by specific alcohol brands?

METHODS

Research Design

This study explored the extent of PYCA scores in televised alcohol advertisements through a content analysis with trained coders, a multi-disciplinary method involving systematic review of text, images and symbols (Krippendorff, 2013). The data were analyzed using univariate descriptive statistics.

Data Sources

Data for this study come from three primary sources: 1) a nationally representative survey (ABRAND) of brand-specific alcohol consumption among youth (age 13-20), 2) data from Nielsen (New York, NY) of all alcohol advertisements aired during a selected timeframe on selected TV programs, and 3) a sample of televised alcohol advertisements.

ABRAND dataset

The Alcohol Brand Research Among Underage Drinkers (ABRAND) survey was administered from December 2011 to May 2012 to 1,032 underage youth, ages 13-20, who had consumed at least one drink of alcohol in the past 30 days. The survey was administered online using a pre-recruited Internet panel maintained by GfK (Palo Alto, CA) and assessed past 30-day consumption of

898 brands of alcohol, including the frequency and amount of each brand consumed.

This list of brands was compiled using multiple sources, including 1) the GfK Mediamark Research and Intelligence (MRI) Survey of the American Consumer that asks respondents (age 18+) about their consumption of over 300 brands of alcohol; 2) the list of alcoholic energy drinks compiled by the National Association of Attorneys General; 3) all alcohol brands advertising on U.S. TV or in magazines from 2006 to 2010 according to Nielsen (New York, NY), and 4) a list generated for 2 pilot studies of youth brand preferences (Siegel et al. 2011a, b). Respondents were first asked if they had consumed any beverages within a category such as liquors or a subcategory such as vodkas. If the respondent answered in the affirmative, a list of the specific brands in that category was presented.

The survey also asked respondents to report their exposure to the 20 TV shows popular among youth as assessed by Nielsen (New York, NY) (*see table 1.2*). The audiences of the TV shows on which the ads aired had among the highest number of youth viewers outside of sports programs. In absolute terms, that means these shows had the potential to expose more youth to alcohol ads than most other television programming.

ABRAND Sample. The pre-recruited Internet panel (KnowledgePanel) consists of approximately 50,000 adults (age 18+) who were recruited using a national probability sample through both random digit dialing (RDD) and address-based sampling (ABS). Ninety-seven percent of U.S. households are included in the GfK sampling frame. To ensure adequate representation of hard

to reach demographic groups, GfK oversamples certain minority groups and offers laptops and Internet connectivity to those without equipment and access. Those aged 18+ who agreed to participate were provided a secure link to access the study site. Participants age 13-17 were recruited by contacting adults in the panel. After obtaining parental permission, youth were invited through email to participate. Only one teen was selected – randomly – from each household. All participants provided informed consent or assent. After completion of the survey, a \$25 gift was credited to the panel member's account.

ABRAND Response Rate. For the 13-17 age group, the parent completion rate was 49.2% (an estimated 4,757 households with one or more teens were eligible, with 2,341 parents giving consent). The screening completion rate was 94.0% (2,341 invitations, with 2,201 teens screened). The survey completion rate was 95.9% (387 eligible respondents, with 371 completed surveys). Thus, the overall response rate for the 13-17 age group was 49.2% multiplied by 94.0% multiplied by 95.9%, or 44.4%.

For the older youth sample (age 18-20), the screening completion rate was 46.2% (2,288 invitations, with 1,058 completed screenings). The survey completion rate was 93.8% (705 eligible respondents, with 661 completed surveys). Thus, the overall response rate for the older youth was 46.2% multiplied by 93.8%, or 43.4%.

ABRAND Survey Instrument. Respondents were first asked about their consumption of categories of alcohol (e.g. beer, flavored alcoholic beverages, vodka, liqueurs, etc.) and then about their consumption of specific brands of alcohol within each category during the past 30 days. A drink was defined as a 12-

ounce can or bottle of beer; a 5-ounce glass of wine or champagne; 4 ounces of low-end fortified wine; an 8.5-ounce flavored malt beverage; an 8-ounce alcohol energy drink; a 12-ounce wine cooler; 8.5 ounces of malt liquor; 1.5 ounces of liquor (spirits or hard alcohol), whether in a mixed drink or as a shot; 2.5 ounces of cordials or liqueurs, and 1 ounce of grain alcohol.

Respondents were also asked whether they had seen any of the 20 TV shows that were most popular among youth as assessed by Nielsen (excepting sporting events) (*see table 1.2*). This including viewing on network, cable, podcasts, downloads, TiVo, etc. during the past 30 days.

ABRAND Analysis and Weighting Procedures. GfK applied post-stratification statistical weights to account for the different selection probabilities associated with the RDD- and ABS-based samples, the oversampling of minority communities, non-response to panel recruitment, and panel attrition. Post-stratification adjustments were based on demographic distributions from the Current Population Survey (CPS) conducted by the U.S. Bureau of the Census. The post-stratification weights adjusted for gender, age, race/ethnicity, census region, household income, home ownership status, metropolitan area, and household size. Previous research has shown that estimates of current drinking using the panel are similar to those from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (Heeren et al. 2008), and two pilot tests were conducted with underage youth that demonstrated the feasibility and validity of this method (Siegel et al. 2011).

Nielsen dataset

Nielsen data is the copyrighted property of Nielsen, available through a license with the Center on Alcohol Marketing and Youth (CAMY). The Nielsen dataset details the time, placement (program and network), audience size by age category, brand and specific creative description of TV advertisements. The TV advertisement sample used in this study was identified using Nielsen.

TV alcohol advertisements

Using Nielsen data, a random, stratified sample of TV alcohol advertisements was identified and purchased from Kantar Media through an award from the JHSPH Department of Health, Behavior and Society.

Sampling Procedure. The televised alcohol advertisements that aired during the ABRAND survey collection period on the 20 TV shows most popular among youth made up the population of advertisements sampled from for this project. Using Nielsen data, it was determined that a total of 193 unique alcohol advertisements fell into the sampling frame. We lacked ABRAND consumption data for two of the brands that aired ads, Black Box Wines and Simply Naked Wines, so these ads were excluded from the sample. Siegel et al. (2013) found that the top 25 most youth consumed brands made up nearly 50% of youth market share (calculated by dividing the total number of drinks for that brand in the past 30 days across the sample by the total number of drinks for all brands), so the sample was stratified according to brand prevalence of consumption with the top 25 most consumed brands defined as the “popular” brands and all other brands as the “unpopular” brands. Within each stratum, a 50% sample was selected at random (n=96) (*see figure 1.1*). A review of sample sizes from content analyses of televised advertisements showed a range from 10

unique ads (Jones et al. 2010) to 1,431 including repeats (Craig, 1992), and the average sample size for unique ads analyzed was 105, making this project's sample size of 96 consistent with the existing literature. A total of 41 brands were represented in the sample.

Data Collection. Kantar Media was contracted to procure the ads. Two Absolut Vodka ads were missing from the database at Kantar Media and were replaced with two other randomly selected Absolut Vodka ads from within the sampling frame. These ads were then purchased in mpeg format from Kantar Media.

PYCA Codebook Development

A codebook was developed that consisted of a comprehensive list of PYCA elements shown by the research literature referenced above to be appealing to youth. The codebook had codes that captured the elements of full motion advertisements and that dealt specifically with alcohol content. The codes focused on both manifest content, which includes text and images that are objectively measureable, as well as latent content such as symbols of overconsumption or peer acceptance. These codes are inherently more subjective but allow for a richer dataset (Berg, 2007).

The codebook went through a number of drafts based on feedback from focus groups, on reviewing the advertisements and on discrepancies between two independent raters. The process of codebook revision is detailed below, with the finalized codebook provided at the end. Specific code operationalization and coding measurement can be found in the appendix.

Focus Groups. In preparation for the research, an early draft of the codebook was presented to a group of high school age youth and to a group of college age youth. The groups were selected based on convenience and availability; the high school aged group was part of a youth advisory committee from the Center for Adolescent Health at Johns Hopkins School of Public Health, and the college aged group was made up of Johns Hopkins University undergraduate students taking a course on alcohol and marketing who volunteered to participate. The groups were made up of approximately 15 youth (aged 14-18) and 7 youth (aged 20-22), respectively. The groups were asked whether the codes captured what they thought they would find appealing in an ad and to define what was appealing about it so to best define the code for the raters. No changes were made to the codes included but the operationalization of the variables was better defined based on these meetings.

Review of the Advertisements. Once the advertisements were received from Kantar Media the ads were reviewed and the codebook was revisited and revised (Riffe, Lacy & Fico, 1998) to assure all relevant content would be captured.

Intercoder Reliability. This project used one primary rater (the author) and a second, independent rater who coded two random subsets of the ads to assess reliability of the codebook. First, the codebook and each variable interpretation were reviewed in-depth by the two raters. Next, four ads that were not part of the study sample were chosen randomly from YouTube. They were viewed together by the raters and the presence or absence of each content variable in the ad was discussed. Discrepancies were identified and, when

necessary, elaborations to the variable interpretation were made in the codebook. At this point, the codebook represented the first, finalized version.

Starting with a 10% random sample of the project ads ($n=9$), both raters independently watched each ad in its entirety first for a sense of the overall ad gestalt then subsequent times for coding. The manifest content was often readily apparent and could be recorded first, whereas the latent content and the more coding intensive content (such as counts of characters) were filled in over subsequent views.

Intercoder reliability on the first 10% random sample was calculated. To calculate Cohen's kappa, all variables were dichotomized as either present or absent. Over all the codes, kappa was 0.75, which is considered significant agreement (Cohen, 1960), and percent agreement was 89%. Some sub-categories of the codes fell below a kappa of 0.7, with one category, theme, at 0.29. Examining the category codes more closely showed that the presence of many of the codes were rare, and therefore percent agreement may be preferable over kappa as the best statistic for assessing reliability in this project (Viera and Garrett, 2005). Percent agreement was over 80% for every category.

Using the revised codebook, the primary rater coded a random 40% selection of the remaining sample ($n=38$) and then the secondary rater coded a random 10% sample ($n=4$) of that. In this small sample, Cohen's kappa was 0.72 and percent agreement was 87%. Emotional appeal codes had the lowest intercoder reliability with 64% agreement and 0.27 kappa. This category contains entirely latent content elements so some subjectivity is to be expected, however the codebook was again revisited and revised to account for the discrepancies. No

ads were recoded with the revised codebook due to the high agreement, and no codes were dropped due to discrepant coding. Even agreement may be due to chance, and disregarding advertisements on which agreement was low may unwittingly limit analyses to those data that merely best conformed to the codebook, as opposed to data that objectively represent the range and depth of alcohol advertising content (Krippendorff, 2013).

The final 50% of the advertisements (n=49) were coded by the primary coder only.

Measures

Finalized PYCA Codebook. The following are the content elements examined in the TV advertisements grouped by category (*also, see appendix*):

Production Value Variables. As shown in the appendix, production value variables included use of:

- *Animation*, (0=no animation, 1=partial, 2=full animation), which was operationalized as any cartoons, drawn/sketched images, or computer generated features, but not introductory or conclusive shots that simply show the product or brand name.
- *Duration* of an ad divided by total number of *edits* (defined as a transition to a new camera shot either related or unrelated to the previous physical environment), was the calculation for the variable *pace*. Past research has separately coded for related and unrelated edits, however in many of the faster moving ads it was difficult to determine the physical environment at all. Consequently, it is likely that viewers perceive each cut as presenting novel information whether related or unrelated.

- *Intense images* (1 or 0) were those shots that were intense, grotesque, disgusting, or horrifying.
- *Sound saturation* (1 or 0) was coded as the presence of background noise during at least half of the ad and could include street noise, crowds talking or cheering, sound effects, music, etc., but not characters talking throughout the ad.
- *Loud* (relative to other sounds in the ad) *and fast* (> 120 beats per minute (BPM)) *music* was coded if present throughout at least half of the ad.
- *Second-half punch* (1 or 0) was defined as the presence of a shocking, startling, or very surprising end to the ad that a first-time viewer could not have anticipated.

Character Appeal Variables. As shown in the appendix, *character appeal* variables were largely coded as 0 for absence of the character type and 1 for presence of the character type. Gender and race representation in ads was measured by counts. These appeals included:

- *Animated characters* were coded (1 or 0) if a character was portrayed by a cartoon, a drawing or sketch or computer generation.
- *Animals* (1 or 0) included any non-human characters such as actual animals as well as anthropomorphized creatures (i.e. robots or the product itself transformed).
- *Celebrity* (1 or 0) was coded for presence of celebrities either portraying themselves or a character they're known for. Celebrity also included well known musicians or DJs performing the ad's music.

- *Fictional spokespersons* (1 or 0) included fictional brand ambassadors. If a celebrity or fictional spokesperson provided a voice-over (narration of the ad without a visual presence) that was coded as *voice-over celebrity/fictional spokesperson*.
- “Youth” actors were coded (1 or 0) if a model appeared to be under age 21.
- *Gender* and *race/ethnicity* were coded through counts of male and female and white, black, Hispanic or Asian actors who were identified as primary in some way (i.e. speaking role, assumed speaking role (miming scenes), member of the focal group even without speaking role, monopolizing a single camera shot even if not a member of the focal group, etc.). Counts did not include background individuals (i.e. people in the environment who are not featured) or the same character appearing more than once.

Theme Variables. As shown in the appendix, *youth-oriented theme* variables were all coded as 0 for absence of the theme, 1 for moderate presence and 2 for strong presence of the theme. Theme variables included:

- Portrayal of *magic* was defined as actions or events with supernatural or metaphysical properties, e.g. items appearing/disappearing out of the air. This code did not apply if actions or events were simply unpredictable or unusual.
- *Fantasy themes* were coded for uses of settings or events that are fictitious or do not occur in real life, but the code was not used if the setting was simply unusual.
- *Violence* was the portrayal of fighting, weapons, etc., but was not coded if the action was slapstick.

- *Humor* included irony, visual humor, slapstick, clownishness, sarcasm, tongue-in-cheek, wordplay, a character telling a joke, etc. Humor was coded if the ad clearly attempts at being funny, even if the coder deemed it unsuccessful.
- *Story-telling format* was defined as the ad having some type of narrative arc. This did not include when individuals tell a story directly to the camera unless the story is enacted as well. It did not include incidental activity in the background of the ad.

Product Appeal Variables. The presence of product appeals was coded as 0 and the absence of the variable was coded as 1 (this reverse coding was done so that higher numbers represented content that in the literature has been shown to increase youth appeal; lower product-appeal content has shown to be of higher appeal). These variables included:

- Assertions of *physical benefits* from the products, defined as appeals to physical sensations such as “refreshing”.
- *Health* appeals were information or allusions to the product providing health benefits, including when the benefit was avoiding an expected or typical harm (i.e. calorie content, carbohydrates, etc.).
- *Quality* appeals included any reference to the quality of the product in terms of the user experience. Appeals to taste, flavors, or unspecified value adjectives like “perfection” were coded as quality.
- Appeals based on product *properties* referred to physical properties of the beverage such as texture, lightness, etc.

- *Composition* was coded for any reference to what goes into crafting the beverage. This included ingredients as well as descriptions of processing the ingredients like barrel maturation or smoking.
- *Competitive appeal* included comparisons made with other brands of alcohol, as well as broad comparisons within a general alcohol type that insinuate beverage superiority, i.e. “world’s best tasting”, “the finest”, etc.
- *Premium or bonus offers* was operationalized as the offer of some perk or extra with purchase.
- *Value* included references specifically to the financial value or quality of the purchase, such as price by alcohol strength or volume.

Emotional Appeal Variables. Each emotional appeal variable was coded as 0 for absence of the appeal, 1 for moderate presence of the appeal and 2 for strong presence.

- *Mood effects* were coded when an ad implied that alcohol is being used (or could/should be used) for relaxation, happiness, fun, increasing boldness, lessening inhibitions, or any other change from basal state.
- *Physical performance* appeals were coded when an ad suggested alcohol will induce physical improvement effects such as strength, sexual performance or entertainment (be a better singer, dancer, etc.).
- *Adventure/spontaneity* appeals referred to product associations with adventurous activities (i.e. skiing, biking, performing onstage, etc.) or spontaneous activities (i.e. sneaking into a VIP lounge, impromptu parties, etc.). It was also coded for suggestions of adventurous personality qualities

like impulsivity, courage or risk-taking.

- *Achievement/success* appeals were portrayals of goal achievement, including financial, social, athletic, and profession success. This was coded even when alcohol was not shown to directly lead to the achievement.
- *Sexual connotation* included showing nudity, sexual activity, sexualized actors, lewd or suggestive images or language or when there was an implication of a past or an impending sexual encounter between characters in the ad.
- *Romance* appeals differed from sexual appeals in that the primary goal of characters appeared as a lasting relationship and/or love.
- *Individuality* was operationalized as an emphasis on character autonomy, such as the models being in control of their own lives, making their own choices, as well as portrayals of notable, personal distinction, such as exhibiting uniqueness or exceptionality.
- *Camaraderie* was coded for portrayals or suggestions of friendship, familiarity, closeness with others, as well as party scenes.
- *Social positioning* referred to showing an actor as a valued member of a group, themes of fitting in, being popular, impressing others, being famous or revered or, praising or celebrating individuals consuming the beverage for unspecified reasons.

Risky Content Variables. Risky content variables were coded as 1 for presence of a variable and 0 for absence of a variable.

- *Injury* was operationalized as the depiction of an activity (both before and

after beverage consumption) that has the potential to lead to injury, including any type of motor vehicle operation or other physical activities requiring alertness or coordination. It was also coded when an ad implied that such physical activities are expected or encouraged while consuming the product or by typical product consumers.

- *Overconsumption* referred to the presence of products in quantities larger than might reasonably be consumed by the models present, for instance, when one large bottle or many empty bottles were visually depicted for a small group of people, showing drinking games, or text or images that imply or encourage binge drinking.
- *Addiction* was operationalized as depicting or referring to consumers drinking alcohol at inappropriate times of the day (i.e. in the morning or during the work day), referring to or providing excuses for drinking, implying or depicting prolonged consumption and using language that implies a need for or dependence on the product.

Industry Code Variables. The content from the industry guidance that was specific enough to be coded included depictions of *Santa Claus*, presence of *branding on materials used primary by youth* such as toys, games, or clothes, and allusions to “*rites of passage*” to adulthood. The codes also disallow models appearing to be under age 21 and cartoon figures primarily appealing to youth, both of which are captured above.

PYCA Score. To calculate a summary score for each ad of the use of the PYCA elements listed above, the code scores (which included a mix of dichotomous and ordinal variables) were standardized and summed. Summing

the code scores (as opposed to taking the average or median) was determined to best represent primarily youthful content appeal as each code was formatted so that a higher score represented the presence of more youth-appealing elements. For instance, presence of camaraderie and sexual connotation, known to be appealing to teens, were coded as 1, whereas the presence of product appeals, known to not be appealing to youth, was coded as 0. Counts of characters present (# of males, females, whites, and minorities) were not included in the summary score as their value in being youth appealing depends on their similarity to the viewer which is unknown.

PYCA Category Scores. Within each content category (i.e. production value, theme, etc.) the unstandardized scores were summed to calculate a total score for each category for each ad.

DATA ANALYSIS

Stata version 12 was used for all analyses. Descriptive statistics (frequency, means and correlations) were performed. The research questions were explored using univariate analyses (t-tests, cross-tabulations, etc.) with interpretation based on p-values and confidence intervals.

RESULTS

Preliminary Analysis

Data integrity. After reviewing the data, five codes were deemed to be inappropriate for inclusion and were subsequently dropped from the analysis. These were *intense images*, *premium/bonus offers*, *value*, *voice over fictional spokesperson* and *loud and fast music*. *Intense images*, defined as images that are intense, grotesque, disgusting, or horrifying, were completely absent in the

sample. This code was adopted from the Niederdeppe et al. (2007) analysis of anti-smoking advertisements, and such counter-advertisements on the risks of harmful behaviors are much more likely than product advertisements to include intense images as part of fear-appeals. Both *bonus offer* and *value* were not present in any of the ads, it was assumed because prices of products differ by geography and the televised advertisements were aired nationally. No ads featured voice-over fictional spokespersons, likely because the spokespersons are only recognizable visually. Loud and fast music was deemed to be redundant, as the loudness of background music was captured by the code “sound saturation” and the speed was captured by the more objective test of BPM.

PYCA Score. Because each content element was measured on different metrics the variable scores were standardized with a mean of 0 and standard deviation of 1 and then summed to calculate a total PYCA score for each ad. The distribution of ad PYCA scores was checked for normality by visual evaluation of a histogram and by using the sum command with option detail in Stata and found to be roughly normal, with a skewness statistic of 0.26 (0 is perfectly symmetrical) and kurtosis of 3.27 (3 is perfectly bell-curved) (Bock, 1975). Using the sktest in stata, the hypothesis that the distribution is nonnormal was tested and rejected (skewness: $p = .27$; kurtosis: $p = .39$).

Correlated Content. All content correlations with a Pearson’s r value higher than 0.29 are detailed here. Ads that had animation tended to feature other non-human characters such as animals ($r = .56, p < .01$), and celebrity presence was often paired with non-human characters ($r = .54, p < .01$), youthful looking models ($r = .38, p < .01$), and adventure ($r = .37, p < .01$). Youthful models

also appeared with adventure ($r=.31, p<.01$), and presence of a main fictional spokesperson was moderately correlated with physical performance ($r=.31, p<.01$). Ads featuring a second-half punch were always used with a humorous theme ($r=.32, p<.01$), though humor ads did not often use a second-half punch.

There were some strong correlations between emotional appeal elements. When mood appeals (happiness, disinhibition, etc.) were present, sexual connotation ($r=.45, p<.01$) and camaraderie ($r=.56, p<.01$) tended to be as well. Performance improvement was likely to appear with adventure ($r=.49, p<.01$), achievement ($r=.37, p<.01$), camaraderie ($r=.31, p<.01$), social positioning ($r=.34, p<.01$), injury ($r=.42, p<.01$) and fast pace ($r=.39, p<.01$). Ads featuring adventure often paired this with depictions of achievement ($r=.41, p<.01$), camaraderie ($r=.4, p<.01$), and social positioning ($r=.34, p<.01$). Injury was also strongly correlated with adventure ($r=.49, p<.01$), likely because adventurous activities that require coordination are those that can also lead to injury. Achievement was associated with individualism ($r=.42, p<.01$) and social positioning ($r=.37, p<.01$), and individualism and social positioning tended to appear together ($r=.54, p<.01$). Social positioning also appeared with camaraderie ($r=.39, p<.01$), and sex was often paired with overconsumption ($r=.35, p<.01$).

Descriptive statistics

Table 1.3 shows descriptive statistics of presence of each PYCA code element in the sample and table 1.4 shows descriptive statistics of the ads by brand. Of the 41 brands included in the analysis, 21 were liquor brands, 15 were beer, 3 were wine, 1 was a flavored alcoholic beverage (categorized as beer below)

and 1 was a premixed cocktail (categorized as beer below). The average ad duration was 26 seconds (SD=9.3) with a minimum duration of 11 seconds and maximum duration of 59 seconds. Samuel Adams Beers had the greatest number of ads in the sample (n = 7) and 41% of the brands (n = 17) aired just 1 ad in the sample. As mentioned above, a few codes were entirely absent in the sample and were consequently dropped from analyses but all other codes were present in at least 6% of ads.

Research Questions 1-2

RQ 1 focused on the extent of use of PYCA elements shown in the research literature to be youth appealing in alcohol advertisements, and RQ 2 questioned differences in the use of these PYCA elements by brand popularity or alcohol type. Overall, the use of PYCA elements in the sample of ads indicated that popular brands had a higher PYCA score (M=2.7, SD=10.16) than non-popular brands (M=-2.72, SD=9.93), $t(94)=-2.61$, $p < .05$, but there was no systematic difference by alcohol type. Beer brands had a mean PYCA score of -0.75 (SD=11.02) and non-beer brands had a mean PYCA score of 0.78 (SD=13.19), $t(94)=.62$, $p = .53$. Table 1.3 shows the extent of presence of each PYCA code in the sample grouped by category, and table 1.4 shows mean PYCA score by brand. Below, I address both RQ 1 and RQ 2 by reporting the presence of each PYCA code in the sample ads and noting differences in their presence by alcohol type or popularity.

Production Value Variables. Ninety-nine percent of ads had sound saturation, 92% had music, mean beats per minute (BPM) was 106 (SD=40) and mean pace (edits/duration) was 0.56 (SD=0.3), meaning that the average ad had

more than one camera cut every two seconds, qualifying as very fast paced (Lang et al. 2000). Overall, there was no significant difference by type or popularity in mean production value PYCA score.

Twelve percent of ads had at least one cut/second. Though pace did not significantly differ by type or popularity, the top 5 fastest paced ads were all liquor brands, the top 4 of which fell into the popular category. Non-beer ads had a moderately higher mean BPM ($M=113.78$, $SD=27.55$) than beer ads ($M=98.47$, $SD=47.66$) $t(94)=1.92$, $p = .06$, but there was no difference by popularity.

Ten percent of ads were fully animated, with an additional 5% featuring just a main character that was animated and 2% featuring just a secondary character that was animated. There were no differences by popularity or alcohol type in use of animation.

Second-half punch was seen in 9% of all ads. Broken down by type, beer brands used second-half punch ($M=.14$, $SD=.35$) moderately more than non-beer brands ($M=.04$, $SD=.20$), $t(94)=-1.69$, $p = .09$. There was no difference by popularity.

Character Appeal Variables. Over 18% of ads included a non-human character, such as animals or anthropomorphized creatures. Though there were no differences in use of non-human characters by alcohol type there was a moderate difference by popularity, with popular brands using more non-humans ($M=.30$, $SD=.55$) than unpopular brands ($M=.12$, $SD=.33$), $t(75)=-1.89$, $p = .06$.

Twenty-three percent of ads featured celebrities or fictional spokespersons, either as a main or background actor, featured musician, DJs or as a voice over. There were no differences by type or popularity in celebrity

representation.

Six ads used actors who subjectively looked under age 21, 2 of which were aired by popular brands, though this was not significant and no one alcohol type used more youthful looking actors than another.

Ads were more likely to include males than females. The mean number of males across ads was 3.19 (SD=3.5) and number of females was 1.89 (SD=2.16), $t(95)=4.03$, $p < .001$. Eighty percent ($n=76$) of ads featured at least 1 male and 68% had 2 or more. Seventy-two percent of ads ($n=68$) included at least 1 female and 40% included 2 or more. Beer ads used more males. The mean number of males present in beer ads was 4.4 (SD=4.2) and in non-beer ads the number was 1.9 (SD = 1.66), $t(63)=-3.97$, $p < .001$. The ads featuring the most females were mixed in type and popularity. Eighteen ads had groupings of 2+ males with one female and 4 ads had groupings of 2+ women with one male. There was no gender representation difference by popularity.

Ads were significantly more likely to feature white actors than minority (African American, Hispanic or Asian) actors. The mean number of white actors featured across ads was 3.93 (SD=3.90) and the number of minority actors was 1.14 (SD=1.91), $t(95)=-7.2$, $p < .001$. Eighty percent of ads featured white actors (73% had 2+) and 36% featured black actors (80% of which had a single black actor). Only 10% included Asian actors (4 ads had 2+) and 16% included Hispanic actors (5 ads had 2+). Beer brand ads featured more white actors ($M=5.29$, $SD=4.5$) than other alcohol types ($M=2.51$, $SD=2.41$), $t(73)=-3.76$, $p < .001$. Among the ads featuring more than 7 white actors ($n=17$), 15 were beer ads, 1 was wine and 1 was liquor. There was no difference in mean number of white actors

featured between popularity groups but popular brands were more likely to feature minority actors ($M=1.68$, $SD=2.31$) than unpopular brands ($M=.61$, $SD=1.22$), $t(69) = -2.81$, $p < .01$.

Theme Variables. Overall, beer brands had a higher mean theme score ($M=1.29$, $SD=1.21$) than non-beer brands ($M=.77$, $SD=.96$), $t(94)=-2.33$, $p < .05$, and popular brands had a moderately higher mean theme score ($M=1.23$, $SD=1.22$) than unpopular brands ($M=.84$, $SD=.99$), $t(94)=-1.76$, $p = .08$.

Ads were more likely to use humor than magic, fantasy or violence ($p < .001$) with 38% including some humorous element. Beer ads used more humorous appeals ($M=.59$, $SD=.64$) than non-beer brands ($M=.23$, $SD=.43$), $t(84)=-3.22$, $p < .01$, with 54% of beer ads, 23% of liquor ads and 25% of wine ads portraying moderate to strong presence of humorous themes. There was no difference by popularity.

The next most used theme was story-telling. Thirty percent of ads featured story-telling formats, more often than magic, fantasy or violence ($p < .05$). Thirty-five percent of beer, 27% of liquor and 0 wine ads used a story-telling format, though these differences by type were not significant. Mean story-telling score was 0.43 ($SD=.58$) among popular brands, which was moderately higher than among unpopular brands ($M=.24$, $SD=.48$), $t(94)=-1.66$, $p = .10$.

Twenty percent of ads used magic or fantasy themes and only 1 ad was coded for violence. Liquor ads (driven by vodka brands) had a higher mean fantasy score ($M=.21$, $SD=.51$) than beer or wine ads ($M=.04$, $SD=.19$), $t(94)=-2.24$, $p < .05$, and beer ads featured magic more often ($M=.24$, $SD=.56$) than non-beer ads ($M=.04$, $SD=.29$), $t(94)=-2.2$, $p < .05$. There were no differences in use

of magic, fantasy or violence by popularity.

Product Appeal Variables. Sixty-five percent of ads included at least one of the 6 product appeal elements known to be unappealing to youth. Three of the 4 wine ads referenced 5 of the 6 product appeal variables. There was a significant effect for popularity, $t(84)=-2.83$, $p < .01$, with unpopular brands using more product appeals than popular brands, and a significant effect for beer $t(94)=-2.19$, $p < .05$, with non-beer brands using more product appeals than beer brands.

The most frequently used product appeal was quality of the beverage, with 39% of ads featuring this message. More unpopular brands used this appeal than popular brands, $\chi^2(1, N=96)=7.60$, $p < .01$, and there was no difference by type.

Thirty-eight percent of ads included a product benefit appeal, based on the physical sensation of consuming the beverage. This was the most frequent product appeal used by beer ads (52%), though overall the percentage of non-beer brands that used this appeal was greater, $\chi^2(1, N=96)=8.91$, $p < .01$. There was no difference by popularity.

Twenty-eight percent of ads appealed based on properties of the beverage, 24% appealed on the beverage composition, and 20% appealed using a competitive appeal with no differences in use by popularity or type. Only 12% appealed on health grounds, with non-beer brands more likely to use this appeal than beer brands $\chi^2(1, N=96) = .79$, $p < .05$.

Emotional Appeal Variables. All but one ad featured an emotional appeal. There was no significant difference by type or popularity in the overall mean emotional appeal PYCA score.

Mood, camaraderie and social positioning appeals were used frequently and fairly equally across brands and alcohol types. Mood appeals were most likely to be present over all other emotional appeals ($p < .001$), occurring in the vast majority of ads (88%).

Sixty-nine percent of ads featured camaraderie or party scenes, with equal representation by alcohol type. There was a significant effect of popularity, $t(94)=-2.54$, $p < .05$, with popular brands ($M=1.28$, $SD=.85$) using this appeal more than unpopular brands ($M=.86$, $SD=.76$).

Almost two thirds of ads featured imagery of achievement. Beer brands used more depictions of achievement than other alcohol types, $t(94)=-2.00$, $p < .05$, but there was no difference by popularity.

Just over half (51%) of the ads used social positioning themes and just under half (48%) included portrayals of individualism. There were no differences by type or popularity in the use of these appeals.

Forty-two percent used performance appeals and 38% used adventure/spontaneity appeals with no significant effect of type or popularity.

Thirty-five percent used moderate to strong sexual connotation but only 15% used romance as an appeal. Liquor ads used significantly more sexual content than other alcohol types, $t(94)=-3.04$, $p < .01$, with mean sex appeal score 0.53 ($SD=.77$) for liquor brands and 0.47 ($SD=.72$) for non-liquor brands. Among the 14 ads featuring strong presence of sexual connotation, 11 were aired by liquor brands and the remaining 3 were beer. Only two ads had strong romantic connotations. There was no difference in use of sex or romance by popularity.

Risky Content Variables. Forty-three percent of ads featured at least one risky content variable (injury, overconsumption or addiction). The most common was injury, followed by addiction, then overconsumption. Popular brands had a higher mean risky content PYCA score than unpopular brands, $t(82)=-2.06$, $p < .05$, though there was no effect by type. There was a significant effect of both popularity grouping and type on use of addiction, with popular brands using more addiction appeals ($M=.26$, $SD=.44$) than unpopular brands ($M=.06$, $SD=.24$), $t(70)=-2.66$, $p < .01$, and beer brands using more addiction appeals than non-beer brands $t(67)=-3.17$, $p < .01$.

Research Question 3

RQ 3 focused on the use of PYCA elements prohibited by the alcohol industry codes. Depictions of *Santa Claus* were absent in all ads; *branding on materials used primary by youth* such as toys, games, or clothes were absent, as were allusions to “*rites of passage*” to adulthood. Some ads did feature models who subjectively looked to be under age 21, which is a violation of the guidance, and some ads included animation but whether that animation primarily appeals to youth and would therefore be a code violation was unclear.

Research Question 4

Based on the ABRAND survey findings that youth drink a relatively small number of brands, RQ 4 focused on variations in the use of PYCA elements by brand. The summed, nonstandardized content scores for the ads ranged from 4.71 (Cavit wine) to 31.85 (Heineken) with a mean of 16.8 ($SD=6.07$). The summed, standardized PYCA scores for the ads can be seen in table 1.4. Jack Daniels Whiskey had the highest brand average PYCA score at 22.1 ($SD=1.5$),

meaning Jack Daniels, on average, aired ads with high overall youth appeal. However, averaging ad scores within each brand hid some patterns of use of youth-appealing content, as there were occasionally large differences in PYCA scores within brands. Smirnoff Vodkas aired an ad scoring 28.25 which ranks second highest in youth appeal among all ads, but Smirnoff's mean PYCA score was 14.9 (SD=12.2). Bud Light, the #1 most consumed brand among youth, ranked 12th on mean PYCA score at 5.4 (SD=8.5) but the range from its highest to lowest scoring ad was 23.3. Because each element was standardized before being summed to create the PYCA score, this roughly means that Bud Light's lowest scoring ad had 23 fewer youth-appealing elements than its highest scoring ad. Fourteen brands (34%) had a difference between their lowest and highest scoring ads of > 10 points, many of these being brands popular among youth such as Coors Light ($\Delta = 14.95$) and Mike's Hard Lemonade ($\Delta = 10.75$).

Production Value Variables. Grand Marnier Liqueur had the highest total production value category score, making use of full animation, fast pace (1.07 cuts per second), sound saturation and 126 BPM. Cavit wine had the lowest production value score. Blue Moon beer and Grand Marnier liqueur featured full animation in all of their ads and Jack Daniels had 1 fully animated ad. Brands that used partial animation included Svedka vodka, Yellow Tail wine, Maker's Mark whiskey, Michelob Ultra, Budweiser Select and Coors Light. The top 5 fastest paced ads were Jack Daniels with 1.41 edits per second, followed by Bacardi rums (1.31), Absolut Vodka (1.25), Hennessy Cognac (1.21) and Disaronno Amaretto (1.17). Two ads, Budweiser Select and Patron, had 0 edits during their 29- and 14-second ads, respectively. Second-half punch was seen in 7

beer ads (by Mike's, Budweiser, Michelob Ultra and Newcastle), 2 liquor ads (Pinnacle vodka and Bailey's) and was absent in wine ads.

Character Appeal Variables. Among the ads featuring more than 5 male actors (n=15), 14 were for beer beverages, clustered within Miller Lite, Newcastle, Samuel Adams, and Heineken brands, with one Bacardi rum ad. Bud Light aired the ad featuring the most female actors, including 10 women, followed by Bacardi Rum (8 women), Dos Equis beer (8 women) and Smirnoff Vodkas (7 women). Though women depicted as objects or highly sexualized were not specifically coded for, these 4 ads featuring the most women were rewatched. The majority of the women in these 4 ads were presented as highly sexualized.

Among the ads featuring more than 7 white actors (n=17), 15 were beer ads, 1 was wine (Yellow Tail) and 1 was liquor (Bacardi rum). Fifteen brands featured celebrities, including Amber Rose (Smirnoff), Sam Elliott (Coors), Ice Cube (Coors Light), Jimmy Fallon (Maker's Mark), T Pain (Bud Light), Lea Michele and Jon Bon Jovi (Disaronno Amaretto), Audrey Napoleon and Mohammed Rafi (Heineken), Swedish House Mafia (Absolut), various rock stars from old footage (Jack Daniels), Lance Armstrong and Voxhaul Broadcast (Michelob Ultra), and Manny Pacquiao (Hennessy). Fictional spokespersons included Budd Light (Bud Light), Captain Morgan (Captain Morgan rum), the most interesting man in the world (Dos Equis), the Svedka robot (Svedka vodka), and Jacques d'Azur (Stella Artois).

Theme Variables. A Heineken and a Bud Light ad tied for the highest theme score, each of which featured 4 different youth-oriented themes. Five of 6 Bud Light ads used humor. Vodka brands Absolut, Smirnoff, Pinnacle, and

Russian Standard Vodka all used fantasy themes in 1 or more ads; the only other brands to do so were Corona Extra and Bud Light. Ads featuring magic were more likely to be beer brands ($p < .05$), specifically, Bud Light, Budweiser Select, Coors Light, Heineken, Michelob Ultra and Mike's Hard Lemonade. The only brand to show violence was Hennessy cognac, which featured Manny Pacquiao, a professional boxer.

Product Appeal Variables. Samuel Adams used the most product appeals, with Michelob Ultra, Guinness, Budweiser Select, Cavit wine, Coors and Korbel champagne also heavily relying on product appeals.

Emotional Appeal Variables. Miller Lite had the highest emotional appeal score, featuring strong presence of mood, performance, adventure, achievement, individualism, social positioning and camaraderie, and moderate presence of sex and romance. Only one ad, Sauza tequila, featured no emotional appeals. Among the 14 ads featuring strong presence of sexual connotation, 11 were aired by liquor brands and the remaining 3 were Miller Lite and 2 Bud Light ads. Only two ads had strong romantic connotations, aired by Heineken and Grand Marnier.

Risky Content Variables. Last, among the risky content variables, two Bud Light ads had the highest risky content score by featuring all three variables – addiction, overconsumption and injury.

DISCUSSION

There is clear evidence of primarily youthful content appeal (PYCA) in alcohol ads, and the brands most popular among youth use more youth-appealing content than unpopular brands. Though these ads all aired on shows to which youth are highly exposed, the wide range in ad PYCA scores suggests it is

not a foregone conclusion that brands advertising on these shows are targeting this demographic. Many ads had very low scores and some were largely defined by their product appeals. Youth exposed to these ads are theoretically less likely to recall them, to identify with them, and to expect positive outcomes from consuming these brands. But many ads fell squarely into a dangerous zone where youth exposure, coupled with this content, could be very impactful on a young audience member's beliefs and behaviors.

Production value features were widely used among both popular and unpopular brands and among all alcohol types. Few ads used a slower pace, quieter settings or lower BPM that could affect a relaxation association with alcohol. Relaxation from a stressful day may be a stronger motivator for an older adult audience who are less likely to be watching *Tosh.O* or *Ultimate Fighter Unleashed*. The majority of ads used attention-grabbing, fast-paced blasts of content that are likely to be appealing to novelty- and thrill-seeking youth. The limited capacity model (LCM) posits that viewers' attention to TV is dependent on voluntary choice and interest in the content but also on involuntary "orienting responses" triggered by the use of certain structural features like edits (Lang, 2000). These responses might be stronger among youth who are still developing executive control, and Niederdeppe et al. (2007) found these features to increase ad recall among youth.

The characters that brands choose to represent their beverage in an ad can be very telling of what market demographic the brand intends to target. The viewer perceiving similarity with an ad character is a powerful tool for eliciting modeling behaviors (Bandura, 1986). Few ads featured subjectively youthful

looking models, which is not surprising as the alcohol industry codes explicitly forbid this, but there were clear patterns in the gender and racial makeup of ads. Males and whites were significantly more represented, particularly in beer ads. This suggests these ads are most likely to appeal to white males who identify with the similar actors, and who associate beer with large parties. Popular brands included more minority actors and so may be more appealing to African American, Hispanic or Asian viewers. It is imprudent to assume perceived similarity based on gender and race alone will trigger modeling, however. For instance, the analysis did not distinguish between sexualized actors and non-sexualized actors in ads, so it should not be concluded that because 72% of ads featured females, these ads will appeal to females.

Imitation is also more likely when the model is seen as attractive and of high status (Austin & Hust, 2005), and 23% of ads used celebrities or famous fictional spokespersons. Celebrity presence is thought to be effective in part because recognition of the person attracts attention to the ad (Atkin & Block, 1983), however whether the celebrities featured in this sample are recognizable by youth is unknown and would be informative in future research.

Popular brands were more likely to use non-human characters. Known to appeal to children, this could establish brand loyalty at an early age.

Theme was a category with clear distinctions by alcohol type and popularity. Overall beer brands and popular brands used more youth-appealing themes than unpopular and non-beer brands. According to research by Chen et al. (2005), youth prefer humor and story-telling over music, animals and people in alcohol advertisements, and the extent of presence of humor and story-telling

in this sample reflects those preferences. Nearly 40% of all ads and more than half of beer ads featured humor. Popular brands were more likely to use story-telling, with 38% of popular brands' ads featuring this appeal. Bud Light, the most consumed brand among youth, had humor and story-telling in 5 of its 6 ads.

The few ads that used fantasy were predominantly vodkas (regular vodka, whipped cream and marshmallow vodkas) which, being sweeter and packaged with colors and sparkle, are likely targeted at younger women (Polaris Marketing Research, 2012). Overall, more liquor ads than beer ads seemed to be targeting females by featuring fantasy, a majority of female characters and rarely using themes of adventure or physical performance that are thought to appeal to males (Nash et al. 2009). Six of the 7 ads that used magic were for beer, which might stand out to younger teens and children who associate magic with children's entertainment and who are more likely to believe in the realism of an ad (Raju & Lonial, 1989).

Product appeals are known to be disliked by youth, and the popular brands and beer brands used significantly fewer of these appeals. Some research has shown that youth do not like product appeals because they do not believe them, for instance, that alcohol does not taste good (Aitken et al., 1988). This hints at why beer ads might have used primarily benefit appeals, that beer is cold and therefore refreshing, not that it tastes good or is well made. Similarly, the product appeal used most by liquor brands was quality, that the beverage is superior and the qualities purer, and they left out appeals based on health or beverage composition. To a teenager, this might be interpreted as, "if I'm going to drink vodka, this one will be the least offensive." Wine, the alcohol type of choice

among drinkers aged 50+ (Gallup, 2013) heavily relied on multiple product appeals.

The finding of extensive use of emotional appeals across brands and alcohol types was unsurprising. The association between alcohol and happiness, celebration, and friendship is widespread and deeply culturally engrained across age groups and countries (Partanen, 1991; Social Issues Research Centre, 1998). Yet there were some interesting patterns among the emotional appeals. Popular brands were more likely to appeal based on friendship, and liquor was strongly associated with sex, a pairing which raises concerns about the prevalence of risky sexual behaviors following alcohol use in teens (NIAAA, 2006). Alcohol was frequently associated with personal achievement, particularly among beer brands, and individualistic achievements (status and distinction through self-reliance) appeared in nearly half of ads. Consumerism has been found to be a crucial part of youth's identity construction (Deutsch & Theodorou, 2010), and the promise that consuming a specific brand of alcohol will help you gain status and stand out in a crowd will be compelling to teens (Pechmann et al. 2005). Many ads linked adventure and physical performance with drinking, and even though the drinking typically occurred after the adventures (which is a requirement of the Beer Institute and DISCUS codes), drinking before adventures may be seen as an added thrill to teens.

The prevalence of risky content in the sample was much higher than previous research has found (Rhoades & Jernigan, 2012), however this previous research on risky content analyzed magazine ads that have less ability to portray timed sequences of events such as drinking after activities (as would be required

by the alcohol industry codes). Popular brands used more risky content overall, and addiction was used more by popular brands and beer brands. The depictions of addiction in the sample were presented as a facet of a carefree lifestyle – that it is fun and funny to have impromptu parties in the workplace, to drink in the morning or to sneak a bottle when the bartender’s back is turned. But the message conveyed is that there are no rules when it comes to drinking, and this message seems likely to be adopted by youth who are just forming their perceptions of what is appropriate drinking.

Limitations

This analysis is subject to some limitations. The use of content analysis as a technique limits the generalizability of the findings. The selection of advertisements was not randomly sampled but purposively sampled from the most popular TV shows among youth stratified by reports of youth brand consumption from the ABRAND survey. The findings cannot be extrapolated to all alcohol advertisements or brand marketing practices in general. However, the use of purposive stratified sampling resulted in the analysis of media messages used by brands with a range of popularity among youth, allowing for comparisons to be made to better understand what appeals are and are not associated with youth drinking preferences. A closer look at the use of certain content among brands already popular with youth and those that may still be trying to garner youth market share should show more nuanced trends.

The low response rate in the ABRAND survey might have introduced a number of unmeasured biases in the sample.

One limitation of the study is the subjective nature of the latent content

elements. The perceptions of trained coders are likely to be different from untrained coders' perceptions, though research has found untrained coders are less conservative in their coding (Austin, Pinkleton, Hust & Miller, 2007), implying that this project is more likely to suffer from type I error than type II. Also, the strong agreement between the raters on the presence or absence of the latent content suggests subjectivity was limited in the results. The coders were also not underage, so their perceptions of what is portrayed in the ads may be different from the actual at-risk population. Additional research is needed that compares youth ratings of advertisements to adults' to check for discrepancies and similarities in coding.

Another unanswered question is whether some content elements are more persuasive than others. For instance, the presence of humor might increase recall and ad liking more than sound saturation, yet both were given equal weight in this project. Testing for strength of appeal using an experimental model would help to clarify this question and perhaps reduce the number of content elements that need to be monitored in ongoing surveillance of alcohol marketing.

This study did not consider youth exposure to advertisements beyond sampling from popular youth TV shows. Looking at the interaction between content and youth exposure to advertisements could help us to better understand the underlying relationship between media exposure and behavior. Examining adult brand consumption as well could indicate if the content coded in this study is appealing to all age groups and not primarily youth, and experimental models testing the appeal broken down by younger and older adolescents could also be helpful.

Implications for Policy and Public Health Practice

The data have significant implications for public health practice. Given that it involves extremely timely analysis of alcohol advertisements aired in the U.S., the project provides researchers and public health practitioners with a more contextualized understanding of what youth are being exposed to in the media today. The findings can help practitioners, parents and communities to directly counter the major messages and norms that youth are receiving. As one example, media literacy education (MLE) is a strategy for countering the persuasive intent of marketing (Schull et al. 2013) by deconstructing media messages with youth. The PYCA elements compiled and identified in this study could be used as key examples in MLE training.

The study paves a path for future research projects such as qualitative interviews with ad agency creative teams, experiments presenting content to youth to test for differential appeal, content analysis using the PYCA index with youth as coders and content analysis using the PYCA index in other mediums such as social media.

In terms of policy, the industry has been largely protected from criticism about ad content through the poorly-defined concept of “primary” appeal, and the literature to date has had little to offer to help better define it. However in this study, the discrepancy between what the literature and what the industry say is youth appealing has left us with an illustrative sample of ads that performed almost perfectly within the alcohol industry recommendations, and not so well within the research literature recommendations. The identification of rampant use of persuasive messaging in light of adolescents’ unique developmental

vulnerabilities to media messages has laid the foundation for efforts to urge the alcohol industry to revise its self-regulated marketing codes.

But even if we grant, for now, that the content is primarily appealing to adults and all the ads adhere to the industry codes, it is nonetheless worth pointing out that the content youth like most (according to research) pervades those alcohol ads airing on TV shows youth watch most. If ads were more carefully placed on TV programs, or if marketers toned down the appeals that youth are most vulnerable to, that could go far toward disassociating adolescent psychosocial needs and alcohol.

Conclusion

This project set out to examine the use of content in alcohol advertisements determined by the research literature but not the alcohol industry to be appealing to youth. Appeals that the literature suggests youth have unique vulnerabilities to were found to occur frequently and consistently in the ads analyzed, but under the assumption that this content is not primarily appealing to youth it is perfectly within the code guidelines to air.

This was the first study to look at brand-specific, U.S., televised alcohol advertisements, a medium heavily consumed by youth with potential to expose youth frequently and repeatedly to alcohol ads, based on youth consumption reports. This project has laid the groundwork for a more robust examination of what content is primarily appealing to youth, to adults, or to both groups, which will be explored in study 2.

Chapter Four: Study 2

Background

Theories on the power of media messages to shape perceptions and expectations suggest that media content is an influential factor in youths' alcohol brand choices and consumption (Bandura, 1986; Gerbner, 1998; Lapinski & Rimal, 2005). Watching others in life and in the media is a part of a process of “informing, modeling, motivating, and guiding personal changes” (Bandura, 2004, p. 150), and media that present a world in which alcohol is a necessary or desirable part of life can take advantage of these modeling tendencies.

Scholars in the field have identified many content elements that are appealing to youth (Aitken et al. 1988; Aitken, 1989; Belstock, Donnelly, Carpenter & Donovan, 2001; Craig, 1992; Fielder, Donovan & Ouschan, 2009; Fogarty & Chapman, 2012; Jones, Phillipson & Barrie, 2010; Lewis & Hill, 1998; Nash, Pine & Messer, 2009; Niederdeppe, Davis, Farrelly & Yarsevich, 2007; Rhoades & Jernigan, 2012; Sloane, Wilson & Gunasekara, 2012; Waiters, Treno & Grube, 2001), and research using content analysis has found frequent use of such appeals across varying media (Austin & Hust, 2005; Chen et al. 2005; Fielder et al. 2009; Jones & Donovan, 2001; Jones et al. 2010; Madden & Grube, 1994; Nash et al. 2009; Rhoades & Jernigan, 2012; Strickland et al. 1982). Alcohol advertising increasingly relies on lifestyle-oriented appeals over product-oriented appeals (Casswell, 1995), and youth expectancies that alcohol use is part of a fulfilling life, that it leads to happiness, fun and social acceptance have been shown to correlate with youth exposure to alcohol advertising (Fleming, Thorson & Atkin, 2004; Jones and Donovan, 2001; Sargent, Wills, Stoolmiller, Gibson & Gibbons, 2006; Wills, Sargent, Gibbons, Gerrard & Stoolmiller, 2009). Youth

who hold such expectations, and perceptions of drinkers as attractive and successful may be predisposed to drinking (Cable & Sacker, 2008; Fisher, Miles, Austin, Camargo & Colditz, 2007; Goldman, Del Boca, & Darkes, 1999; Jones & Donovan, 2001; Leigh & Stacy, 2004; Patrick, Wray-Lake, Finlay & Maggs, 2009). The broader conclusion that can be drawn is through persuasive appeals in advertising, youth develop positive expectations and perceptions of alcohol use that predispose them to drinking.

The presence in alcohol advertisements of these content elements that youth find appealing is possible because of the vagueness of the alcohol industry's guidelines on marketing and youth. These guidelines stipulate that if content is "primarily" appealing to youth it is unacceptable within the guidelines. What is primarily appealing, however, is unclear. The industry uses a circular definition, defining primarily appealing as content having: "special attractiveness to such persons beyond their general attractiveness for persons above the legal drinking age." (DISCUS, p. 2, 2011; Beer Institute, p. 5, 2011).

The guidance would ideally disallow the presence of messages and imagery that create positive youth expectations about drinking, but under the assumption that such messages and imagery may also appeal to adults they are allowed within the guidelines.

To date, the research literature has not addressed the question of what content appeals to all age groups and what content is primarily appealing to youth. In study 1, the content elements indicated by the research literature to be youth-appealing were compiled into a scale of primarily youthful content appeal (PYCA), and a content analysis showed prevalent use of many of these appeals in

a sample of television ads aired on the most popular TV shows among youth.

Study 2 will test the PYCA scores for differential association with adult and youth alcohol consumption.

Research Questions

An analysis of the association between advertising content regarding alcohol and drinking patterns for both youth and adults is needed. Examining differential associations between the popularity of a brand among adults and among youth and that brand's use of youth appealing content could help illuminate specific content that primarily appeals to youth. The hypotheses I test in this paper are the following:

H1a: There will be a positive association between brand PYCA scores and youth alcohol consumption by brand.

H1b: There will be a positive association between adult and youth alcohol consumption by brand.

H1c: There will be an interaction between PYCA score and brand popularity on youth alcohol consumption.

H1d: There will be an interaction between PYCA score and alcohol type on youth alcohol consumption.

H2: There will be a negative association between brand PYCA score and adult alcohol consumption.

H3: There will be a positive association between brand PYCA score and youth alcohol consumption relative to adult alcohol consumption.

METHODS

Research Design

This study tested the differential association between mean brand PYCA score and brand consumption among youth and adults using descriptive statistics and multivariate linear regression analyses with prevalence of alcohol consumption within each population (youth and adult and youth:adult) as the outcome.

Data Sources

Data for this study come from three primary sources: 1) a nationally representative survey (ABRAND) of brand-specific alcohol consumption among youth (age 13-20), 2) the GfK MRI (New York, NY) Survey of the American Consumer of brand-specific alcohol consumption among adults (age 21+), and 3) a content analysis of televised alcohol advertisements' use of content elements determined by the research literature but not the alcohol industry to be appealing to youth.

ABRAND dataset

The Alcohol Brand Research Among Underage Drinkers (ABRAND) survey was administered from December 2011 to May 2012 to 1,032 underage youth, ages 13-20, who had consumed at least one drink of alcohol in the past 30 days. The survey was administered online using a pre-recruited internet panel maintained by GfK (Palo Alto, CA) and assessed past 30-day consumption of 898 brands of alcohol, including the frequency and amount of each brand consumed. Specific details about the ABRAND methods, sample, survey instrument, response rate and weighting are referenced above and in more detail elsewhere (Siegel et al. 2013). The ABRAND survey found that top 25 most consumed brands (*see table 2.1*) made up nearly 50% of youth market

share and all 25 had a youth consumption prevalence rate of 0.9 or above (Siegel et al. 2013). These 25 brands were considered the “popular” youth brands, and the remaining brands the “unpopular” youth brands in this project.

GfK MRI Survey of the American Consumer

The Survey of the American Consumer (New York, NY) is a written, self-administered survey conducted in seven-month waves and administered to approximately 13,000 U.S. adults (age 18+) of their use of a wide range of consumer products. Respondents are asked to report their past 30-day (for flavored alcohol beverages and liquors) and past 7-day (for beer and wine) consumption of 320 brands of alcohol. The consumption rates from respondents age 21+ were used in this project. Table 2.1 shows the adult prevalence of consumption rates for the top 25 most popular youth brands.

Content Analysis

As detailed in study 1 above, a sample of 96 televised alcohol advertisements were analyzed using a codebook of primarily youthful content appeal (PYCA) elements. These elements fell into 6 broad categories: production value, character appeal, theme, product appeal, emotional appeal, and risky content (*see Appendix*). Intercoder reliability was high, with percent agreement over 80%. The analysis found evidence of the presence of PYCA elements in the sample of ads.

Sampling Procedure. As depicted in figure 1.1, the TV alcohol advertisements that aired during the ABRAND survey collection period on the 20 TV shows most popular among youth according to Nielsen were identified (n=193). The sample was stratified according to brand prevalence of

consumption among youth (from ABRAND) with the top 25 most consumed brands defined as the “popular” brands and all other brands as the “unpopular” brands. Within each strata, a 50% sample of ads was selected at random and analyzed (n=96).

Measures

Primarily Youthful Content Appeal (PYCA). As described in study 1, each televised advertisement was coded for the presence of over 40 different content variables that were indicated primarily by the research literature to be youth appealing (*see appendix for codebook*). To create an ad PYCA score, the code scores for each content element were standardized and summed for each ad. To create a brand average PYCA score, the ad PYCA scores from within each brand were summed and then divided by the number of ads aired by that brand.

Prevalence of Youth Consumption. The prevalence of youth brand-specific alcohol consumption was defined as the weighted proportion of all ABRAND respondents who reported consuming a brand of alcohol in the past 30 days regardless of quantity. It is a continuous variable ranging from 0% of the population to 27.9% (*see table 2.1*).

Popularity. Brand popularity was defined by prevalence of youth consumption from ABRAND. The top 25 most popular brands among youth according to the ABRAND survey made up nearly 50% of youth market share. These brands were categorized as the “popular” youth brands (coded as 1) and all other brands as the “unpopular” youth brands (coded as 0). An interaction term between popularity and brand PYCA score was created to test for a nonlinear association between consumption and content.

Prevalence of Adult Consumption. The prevalence of adult brand-specific alcohol consumption was defined as the proportion of GfK MRI respondents who reported consuming a brand of alcohol in the past 30-days (for flavored alcoholic beverages (FAB) and liquors) or 7-days (for beer and wine). Research suggests primarily beer or wine drinkers drink more frequently than liquor or FAB drinkers, which should minimize the effect of the differing measurement timeframes for the alcohol types, but the analyses also controlled for alcohol type.

Youth to Adult Consumption Ratio. Youth alcohol consumption relative to adult alcohol consumption was calculated by dividing the prevalence of youth consumption by prevalence of adult consumption for each brand. This variable served as a measure of relative, or disproportionate, youth consumption of a brand compared to adult consumption of a brand.

Type of Alcohol. Type was measured as a dichotomous variable of beer brands compared to other alcohol type brands. There were not enough wine, liqueur or flavored alcoholic beverages (FAB) brands to sufficiently populate their own groups so grouping beer versus other was chosen. Flavored alcoholic beverages (including premixed cocktails) were categorized as beer (n=49), and wine, liquor and liqueurs were categorized as 'other' (n=47). This grouping decision was based on alcohol by volume (ABV) %, in which beer and FABs were more similar, and wine, liqueurs and liquor were more similar. An interaction term between type of alcohol and brand PYCA score was created, calculated as the product of type and brand PYCA score.

DATA ANALYSIS

Stata version 12 was used for all analyses. Descriptive statistics (frequency, means and correlations) were assessed. The study hypotheses were tested using multivariate linear regression with consumption (youth, adult or youth:adult ratio) as the dependent variable (*see table 2.4*). Brand PYCA score and type of alcohol were independent variables in all regression equations, and adult consumption was included as an independent variable when youth consumption was the outcome and vice versa. Following the main effects, the type x PYCA score and the popularity x PYCA score interaction terms were entered individually in a separate block to partial out the main effects and control for multicollinearity (Cohen & Cohen, 1983).

RESULTS

Preliminary Analysis

PYCA Score. The summed, nonstandardized PYCA scores for the ads ranged from 4.71 (Cavit wine) to 31.85 (Heineken) with a mean of 16.8 (SD=6.07). Because the content elements were measured on different metrics the variable scores were standardized with a mean of 0 and standard deviation of 1 and then summed to calculate a total PYCA score for each ad. The Chronbach's alpha estimate of the reliability of the entire scale was 0.77.

Youth and Adult Prevalence of Consumption. A visual examination showed both adult consumption and youth consumption to be right skewed, with most brands being consumed by small proportions of the population, particularly among the 13-20 year olds. The Shapiro-Wilk normality test showed either a log or square root transformation of the variables would shift the distributions closer to normal though significant p-values suggested they would not reach a normal

distribution (Shapiro & Wilk, 1965). Skewness and kurtosis tests supported this (Bock, 1975). An examination of the distribution of the residuals was conducted. Using a standardized normal probability plot and quantile plot (*see figures 2.1 and 2.2*), it was determined that a square root transformation of both prevalence variables best approximated a normal residual distribution (Chambers, Cleveland, Kleiner & Tukey, 1983), and the transformations were performed. These square root transformed prevalence terms were used as the outcome in the below analyses.

*Prevalence Ratio*². The youth:adult consumption ratio had a bimodal distribution. Following the same steps as described above, it was determined that a square root transformation of the variable most closely approximated a normal residual distribution (*see figures 2.1 and 2.2*) and was performed.

Alcohol Type. Because of the changing trends in youth's preferences by type, variability in the consumption rates by alcohol type was tested. As shown in table 2.4, alcohol type modified the main effect of brand PYCA score on adult consumption and modified the main effect of brand PYCA score on youth consumption and the youth-to-adult consumption ratio only among the unpopular brands.

Descriptive Statistics

Table 2.2 shows descriptive statistics for the sample including youth and adult consumption rates for each brand. Of the 41 brands included in the

² As this variable is a ratio, performing a square root transformation changed the absolute differences between values, but maintained the relative rankings of the brands. The analyses were also performed with the raw prevalence ratio data and results are shown in table 2.4.

analysis, 21 were liquor brands, 15 were beer, 3 were wine, and 2 were flavored alcoholic beverages (FAB). Of these 41 brands, 3 were not represented in the GfK MRI adult consumption data - Pinnacle Vodka, Avion Tequila and Daily's premixed cocktails. These three brands together aired 6 ads in the sample making the comparison sample 90 advertisements and 38 brands. Samuel Adams Beers had the greatest number of ads in the sample ($n = 7$) and 41% of the brands ($n = 17$) aired just 1 ad in the sample.³ Figure 2.3 shows a box plot of PYCA scores grouped by popularity. Jack Daniels Whiskey had the highest mean PYCA score at 22.1 (SD: 1.5) and Cavit wine had the lowest at -32.78. Fourteen brands had a difference between their lowest and highest scoring ads of > 10 points, many of these being brands popular among youth such as Bud Light ($\Delta = 23.3$), Coors Light ($\Delta = 14.95$) and Mike's Hard Lemonade ($\Delta = 10.75$).

Correlations

Table 2.3 shows the correlations between the primary predictors and outcome measures. Adult and youth consumption were strongly positively correlated ($r=.93$, $p < .001$), suggesting a large degree of overlap in the brands youth and adults drink. Advertisement PYCA score was correlated with youth consumption ($r=.29$, $p < .01$) and youth to adult ratio of consumption ($r=.41$, $p < .001$). Brand PYCA score, which represents the mean ad PYCA score within brands, was correlated with youth consumption ($r=.34$, $p < .01$) and youth to adult ratio of consumption ($r=.48$, $p < .001$). Type of beverage, coded as 1 for beer, 0 for other, was correlated with youth consumption ($\rho=.35$, $p < .01$) and

³ One way to quantify patterns within brands is by calculating the intraclass correlation coefficient (ICC). However, given that there were different numbers of ads aired by each brand, all analyses were conducted using brand averages.

with adult consumption ($\rho=.41$, $p < .001$). Popularity group was correlated with all consumption variables but is not informative as popularity was defined based on the youth consumption data, with popular brands consisting of those top 25 most consumed brands among youth and unpopular brands consisting of the remaining brands measured in the ABRAND survey.

Multivariate Linear Regression Models

Results of hierarchical regression equations, in which predictors were added successively to multiple regression models, used to test the hypotheses are shown in table 2.4. All analyses are at the brand level and all beta coefficients are standardized. The predictive effects of brand PYCA score on the alcohol consumption outcomes were tested, as well as whether the main effect of PYCA score was modified by adult or youth consumption, type of beverage or an interaction with beverage type and brand popularity group. The interpretation of the models was based on the magnitude and direction of point estimates from standardized beta coefficients and confidence intervals for primary predictors.

Hypotheses 1a-1d

Hypothesis 1a predicted a positive association between brand PYCA score and youth consumption. In a baseline bivariate linear regression model there was a positive association between brand PYCA score and youth consumption ($\beta = .34$, $p < .01$). Though this was not a primary hypothesis, assumptions of linearity of the association were tested. As the PYCA score represents a sum total of all youth appealing content elements present in an ad, as these elements increase the ad could reach some saturation point and become cluttered and unappealing to the audience. In the data this could be represented by a curvilinear

relationship between youth appeal score and consumption. Following Berry and Feldman's (1985) recommendation, terms were computed for brand PYCA score squared, brand PYCA score cubed and brand PYCA score to the fourth power. In an initial model, brand PYCA score and brand PYCA score squared had no association with youth prevalence of consumption. All polynomial terms and brand PYCA score were then included in a simultaneous nested multiple linear regression model with youth consumption as the outcome. A likelihood ratio test indicated that adding any of the polynomial terms to the model would not significantly improve the fit compared to the model with brand PYCA score alone. Hence, non-linear trends were not detected.

Hypothesis 1b predicted a positive association between adults' alcohol consumption and youths' alcohol consumption. In a second model, adult consumption, alcohol type and popularity grouping (1=the top 25 most consumed brands among youth; 0=less consumed, remaining brands) were added as main effects. Brand PYCA score was positively associated with youth consumption ($\beta = .14, p < .001$), as was adult consumption ($\beta = .64, p < .001$), and popularity ($\beta = .39, p < .001$). The variance inflation factor scores for the variables were all below 2 indicating no collinearity. A likelihood-ratio test showed adding adult consumption to the model significantly improved the fit compared to the model with brand PYCA score alone ($p < .001$), but adding beverage type did not.

Because brands were sampled based on popularity, hypothesis 1c predicted an interaction between PYCA score and brand popularity on youth's alcohol consumption. There was a significant interaction effect ($\beta = .15, p < .001$), so the regression analyses were run separating by popularity group.

Among the popular brands, brand PYCA score was positively associated with youth consumption ($\beta = .33, p < .001$), as was adult consumption ($\beta = .84, p < .001$), but alcohol type was not. Among unpopular brands, there was no association between brand PYCA score and youth consumption, but there was a main effect of adult consumption ($\beta = .70, p < .001$) and type ($\beta = .24, p < .05$) on youth consumption. Figure 2.4 shows an added variable plot (AVP) of brand PYCA score by youth consumption for both popular and unpopular brands. The AVP removes the influence of the other predictors and overlays linear regression lines for the adjusted relationship between youth consumption and brand PYCA score. Though both regression lines slope upward the effect is stronger among popular brands.

Hypothesis 1d predicted an interaction between brand PYCA score and alcohol type on youth consumption. As shown in table 2.4, there was no PYCA x alcohol type interaction effect on youth's alcohol consumption among either the popular or unpopular brands.

Hypotheses 2

Hypothesis 2 predicted a negative association between brand PYCA score and adult consumption. The association between brand PYCA score and adult consumption was not significant in the baseline model. Assumptions of linearity of the association were tested. The terms brand PYCA score, brand PYCA score squared, brand PYCA score cubed and brand PYCA score to the fourth power were included in a simultaneous nested multiple linear regression model with adult consumption as the outcome. A likelihood-ratio test indicated that adding any of the polynomial terms to the model would not significantly improve the fit

compared to the model with brand PYCA score alone.

Mirroring the analyses with youth consumption, in a second block youth consumption, alcohol type and popularity grouping were added as main effects. Brand PYCA score was negatively associated with adult consumption ($\beta = -.15, p < .001$), adjusting for youth consumption ($\beta = .76, p < .001$), alcohol type ($\beta = .20, p < .001$), and popularity ($\beta = .17, p < .01$), which were all positively associated with adult consumption. A likelihood-ratio test indicated that adding both youth consumption and type to the model improved fit ($p < .001$). The variance inflation factor scores for the variables were all below 2.4 indicating no collinearity. In a third block an interaction term between brand PYCA score and popularity was included. There was not a significant interaction effect so no further regressions were conducted separately for popular and unpopular brands. Figure 2.5 shows an adjusted variable plot of brand PYCA score and adult consumption, adjusting for youth consumption, popularity grouping and alcohol type.

Hypothesis 3

The final hypothesis predicted a positive association between brand PYCA score and youth consumption relative to adult consumption, calculated as youth prevalence of consumption divided by adult prevalence of consumption by brand. In this model, the square root transformed youth to adult prevalence ratio was the outcome and brand PYCA score and alcohol type were the main effects. Brand PYCA score was associated with the consumption ratio ($\beta = .02, p < .001$) in the baseline model, indicating that brands with higher youth-appealing content were consumed by more youth than adults. As in the previous analyses, in a second

block type and popularity were added as main effects. Brand PYCA score ($\beta = .31$, $p < .001$) and brand popularity ($\beta = .68$, $p < .001$) were positively associated with the youth-to-adult consumption ratio. The variance inflation factor scores for the variables were all below 1.1 indicating no collinearity. A likelihood-ratio test indicated adding type to the model did not improve model fit. In a third block the popularity*brand PYCA score was added as an interaction term. There was an interaction effect ($\beta = .18$, $p < .05$) so the analyses were conducted separately for popularity group. Among the popular brands, PYCA score was associated with the consumption ratio ($\beta = .68$, $p < .001$) but type was not and among the unpopular brands type was associated with the consumption ratio ($\beta = .41$, $p < .01$) but brand PYCA score was not. A likelihood-ratio test indicated adding type only significantly improved the fit of the model among the unpopular brands ($p < .01$) compared to the model with brand PYCA score alone.

DISCUSSION

The results of the analyses demonstrate that alcohol brands airing content that is highly youth appealing are more likely to be associated with higher youth consumption regardless of adult consumption and type of alcohol. This tends to support the idea that youth are not simply mirroring the drinking patterns and preferences of adults, as even after taking into account any effects that adult alcohol preferences have on youth, advertising content appears to explain some of the variance in youth drinking choices.

This effect was not strengthened when the brand ad was for beer compared to other alcohol types, which, combined with the lack of a correlation between alcohol type and brand PYCA score, suggests that beer and liquor brands

advertise in similar ways and corroborates research suggesting youth are drinking beer and liquor in similar quantities (Siegel et al. 2011c). The effect of PYCA score on consumption was strengthened when the brand ad was one of the 25 most popular brands among youth, however.

Separating by popularity group, the significant positive association between PYCA score and youth consumption was maintained among the popular youth brands but PYCA was not associated with consumption among unpopular brands. There are many potential reasons for the lack of an association among unpopular brands, though the findings seem to corroborate research that has found that youth are mistrustful of marketing (Boush, Friestad, & Rose, 1994; Gunter, Oates & Blades, 2005) and that advertising expenditures predict brand loyalty among youth (Gentile, Walsh, Bloomgren, Atti & Norman, 2001). Youth may accept the appeals of brands that they like and have developed loyalties for but reject it from brands they do not like, particularly if the ad appears to be trying to persuade a younger audience through the use of many youth appealing elements.

The finding that brands using PYCA elements were more likely to have lower adult consumption after adjusting for youth consumption and type is significant. The content elements that populated each ad's PYCA score are ones that the alcohol industry does not currently include in their codes as being primarily youth appealing on the grounds that they are as appealing to adults, yet these data suggest adults actively dislike them. If adults do not find these elements persuasive, it would be justification for revising the alcohol industry good marketing practice codes to include these content elements as ones to avoid.

The youth-to-adult prevalence of consumption ratio represented a measure of relative, or disproportionate popularity of, a brand among youth over adults, after accounting for differences in drinking patterns between the two groups. It was notable that, given the high correlation between youth and adult prevalence rates, popular youth brands with high PYCA scores were more likely to be consumed by youth in disproportionate numbers. This implies that even if the content is as appealing to adults as to youth (which these analyses suggest it is not), the message may have a more persuasive effect among youth. Perhaps it is the combination of adolescents' lack of experience with drinking and the power for media to act as a "super-peer" that explains this disproportionate association. A "super-peer" modeling drinking behaviors (such as overconsumption) might be taken by youth to be normative (Wills et al. 2010), but might be rejected by adults in favor of their already established drinking norms (Austin 1994). Another possibility is in adolescents' pursuit of "fitting in", their beverage preferences are more likely to cluster around a few pre-approved choices, increasing the proportion of youth consuming a small number of brands. This does not rule out ad content as a contributing factor in these choices, but it could be that youth choices are driving advertising content intended to maintain brand loyalty among youth.

Finally, the lack of an association between alcohol type and youth consumption among the popular brands suggests that most youth are or have already changed their drinking preferences from primarily beer to beer and liquor. What is driving this increase in liquor consumption is unknown, but as beer and liquor did not systematically differ in their PYCA scores, it raises the

question of whether certain appeals are more persuasive in a liquor ad than a beer ad. Alternatively, liquor advertisers might simply be mimicking beer ads as the gold standard, catching up in market share but destined to hit a ceiling of youth consumption equal to beer. In that case it is more significant that adults' beverage preferences diverge from youth's, adding further support to the theory that youth have unique vulnerabilities to advertising. Future research should continue monitoring this trend.

Limitations

The most important limitation of this study is in the difference between the Nielsen and ABRAND datasets. The findings rely on the assumption that the youth surveyed in ABRAND are likely to have been exposed to the ads selected through Nielsen. This limitation has been minimized in two major ways: first, only the ads that aired on popular youth TV shows were included, and second, only the ads that aired while the ABRAND survey was in the field were included.

An additional limitation concerns the collection of the ABRAND data. For youth ages 13-17, the parental permission rate was 49.2% and youth completion rate was 95.9%, creating an overall 44% response rate. For older youth (age 18-20), the response rate was 43.4%. Weighting the survey responses from those respondents less likely to have participated reduced the possibility of non-response bias, however, parents may have many, varied reasons for either permitting or not permitting their teenager to participate in a survey about alcohol, creating biases that were unaccounted for in the survey. This brings up another limitation – youth who are drinkers may be systematically different from non-youth drinkers in unknown ways. Longitudinal analyses measuring exposure

to high PYCA advertisements and consumption rates of both drinkers and pre-initiation drinkers would provide a more generalizable look at the influence of advertising among youth overall.

In addition, there may be recall bias in the consumption data from ABRAND, but presenting the respondents with specific brand beverage names, which has been shown to increase accuracy of recall, minimized this (Siegel et al., 2013).

The ABRAND and GfK MRI surveys are cross-sectional, meaning assumptions about a causal relationship between advertising and consumption are unwarranted. It is likely that other, unmeasured variables also contribute to the variance in youth brand preferences such as price, availability, and family history of alcohol use. Were causality to be known, direction still would not be. Advertising content may be shaping youth's drinking patterns, or it may be that marketers know youth preferences and advertisement content is shaped to maintain market share. For instance, markets with higher consumption may attract more advertising.

One limitation concerns the adult prevalence of consumption data. The GfK MRI survey collected data on a third of the brands included in the ABRAND dataset, resulting in 3 sample brands for which there were no adult prevalence data. The adult data were also collected at a different time than the other two data sources, and if marketing strategies changed in the interim and there were widespread brand loyalty effects, one cannot say whether this sample of ads reflects marketing influences on adults' drinking patterns. However, research suggests that marketing campaigns try to maintain consistency in brand

personality and brand message (Cohen, 2014), and given the strong correlation between youth and adult preferences, despite the data being from two distinct datasets and time periods, this lends strength to the assumption that brand preferences may be fairly stable over time. This suggests that the differences in the datasets should not overly systematically bias the comparison.

The ads were also selected because they aired on TV shows with high youth audiences, so the possibility that adults were less likely to have seen them and be influenced by them needs to be considered. These shows have larger adult audiences than youth audiences so there is no clear reason to suspect adults have not seen the ads. However, if adults have not seen them, this would suggest that PYCA ads with high PYCA scores are being misplaced on TV and should be limited to TV shows that are less popular among youth. It could also be the case that the content would be persuasive to a younger adult audience (i.e. 21-34 year olds). Future research should categorize prevalence of adult consumption by age groups, and run similar analyses on ads airing on popular TV shows among adults.

Implications for Policy and Public Health Practice

These findings have significant implications for policy. The alcohol industry self-regulates its marketing practices, and this research suggests the framework currently in use as to what is acceptable content is insupportable. As the data are brand-specific, this allows for a more sophisticated analysis of patterns of youth drinking than has been possible before, including the identification of particular brands that are using highly youth appealing content.

Using media advocacy, these brands can be publicly pressured to adopt stricter guidelines around the content of their marketing campaigns.

The Nielsen and ABRAND datasets provide the opportunity to simultaneously link content and consumption data to help explicate the underlying process between exposure to advertising and youth consumption. Understanding the role that content plays in this process informs researchers and practitioners that if it is not being done already, brand content use needs to be a part of ongoing monitoring and surveillance activities.

Finally, public health research now has a scale to use to measure youth appeal in advertising. The standardization of this measurement in the field would allow for comparisons to be made in advertising activities and effects across populations, media, and over time.

Conclusion

The industry guidelines and the research literature have different objectives – whereas the industry nominally focuses on content that is primarily youth appealing, the research literature examines content appealing to youth without asking whether it is equally appealing to adults. The findings from this project, which are the first to associate the content of alcohol ads with both youth and adult consumption of specific brands, call into question the appropriateness of the current alcohol industry guidelines for advertising content and suggest the industry's definition of primary appeal is insupportable.

Chapter Five: Study 3

Background

The evidence that youth are highly exposed to alcohol marketing has generated much interest among alcohol researchers in whether there is a causal relationship between exposure and underage drinking (Engels, Hermans, van Baaren, Hollenstein & Bot, 2009; Fisher, 1993; Nelson, 1999). A number of longitudinal studies (Connolly et al. 1994; Ellickson et al. 2005; Grenard, Dent & Stacy, 2013; Snyder, Stacy et al. 2004) and cross-sectional studies (Austin & Knaus, 2000; Collins, Schell, Ellickson & McCaffrey, 2003; Collins, Ellickson, McCaffrey & Hambarsoomians, 2007; Fleming et al. 2004) have examined whether youth exposure to alcohol advertising contributes to underage drinking and have found positive associations between exposure and drinking initiation, drinking quantity and frequency and having positive attitudes about alcohol. However, the evidence is mixed.

In some studies exposure to alcohol advertising has been shown to exert itself differentially between non-drinkers and baseline drinkers (Smith & Foxcroft, 2009) but not in others (Anderson, de Bruijn, Angus, Gordon and Hastings, 2009). Studies differ in the measures of advertising exposure used, raising doubts on conclusions drawn from the body of work as a whole. Some studies focus on the correlation between self-reported exposure or ad recall and youth consumption (Connolly, Casswell, Zhang & Silva, 1994), others focus on reported hours spent watching TV and youth consumption (Stacy, Zogg, Unger & Dent, 2004) and still others use advertising expenditures as a predictor of youth consumption (Snyder et al. 2006). Further, these studies measure exposure to any alcohol advertising and do not ask about specific brand marketing.

The relationship between exposure to alcohol advertising and alcohol consumption has to be investigated in the context of novelty of the ads. In a review article, Saffer (2002) reports on the findings of econometric studies showing no effect of exposure to advertising on youth consumption, but argues that this occurs because advertising has a diminishing effect over time. Research has shown that after a certain point, repeated exposure to the same advertising campaign results in stabilized or diminished advertising effects (Acknoff & Emshoff, 1975; Wind & Sharpe, 2009). This diminishing effect of advertising could present as a negative association between high (saturated) exposure and youth consumption, but a positive association between low (but novel) exposure and youth consumption. This trend would skew the results of studies that have tested for a positive, linear relationship between exposure and consumption, and could explain some of the discrepancies in findings.

A report by the alcohol industry-supported International Center for Alcohol Policy to the World Health Organization (2003) concluded simply that the evidence to support an association between advertising and youth consumption is insufficient. Similarly, Nelson (2011) conducted a meta-analysis of 21 longitudinal studies and found many primary studies' results to be inconclusive and the literature as a whole to suffer from publication bias.

One explanation for the contradictory findings could be the failure to take into account the content of the advertising, among other things. In study 2, a significant association between the use of primarily youthful content appeal in alcohol advertisements and youth consumption was indicated. Thus, content of

messages is tested in study 3 in relation to youth exposure to alcohol advertising and youth alcohol consumption.

Research Questions

This project will test the relationship between exposure and consumption in the presence of youth appealing content. For the first time, we will be able to see if content strengthens the influence of exposure on actual underage drinking reports. The hypotheses I test in this paper are the following:

- H1: There will be a main effect of youth exposure to alcohol advertisements on self-reported youth alcohol consumption.
- H2: There will be a main effect of brand PYCA score on self-reported youth alcohol consumption, adjusting for youth exposure.
- H3: There will be an interaction between youth exposure and PYCA score on youth consumption such that the influence of exposure will be strengthened by primarily youthful content appeal (PYCA).

METHODS

Research Design

This study tested the relationship between brand PYCA score, youth exposure to brand advertising and youth alcohol brand consumption using descriptive statistics and multivariate linear regression analyses.

Data Sources

Data for this study come from three primary sources: 1) a nationally representative survey (ABRAND) of brand-specific alcohol consumption among youth (age 13-20), 2) data from Nielsen (New York, NY) of exposure among youth (age 12-20) to a sample of alcohol advertisements and 3) data from a content

analysis of a sample of televised alcohol advertisements' use of content elements determined by the research literature but not the alcohol industry to be appealing to youth. Details about the ABRAND and Nielsen datasets and the content analysis are provided in the previous sections.

Measures

Brand PYCA score. Each televised advertisement had been coded for the presence of 40 different content variables that were indicated by the research literature to be youth appealing (*see appendix for codebook*). Further details were provided in study 1 above.

Brand Exposure score: Exposure was measured using *adstock*, which is a calculation of cumulative advertising exposure with more distant exposure down-weighted using a decay rate. The assumption behind *adstock* is that the effect of advertising accumulates with repeated exposure; the initial impression is the most impactful, but over time the impact diminishes and must be refreshed with new exposures (Broadbent, 1979; Joy, 2006). The calculation starts with ad gross rating points (GRPs). GRPs are monthly total impressions (total views) of an ad within a population (in this case youth age 12-20) divided by the size of that population. It can be thought of as a measure of youth's potential exposure to any given ad (Wakefield et al. 2006). Using Nielsen data for each appearance of the sample ads on the 20 selected TV shows from Dec. 2011-May 2012, *adstock* was calculated by summing the GRPs per sample ad per month with a discount applied to the GRP for each previous month. For example, the calculation for *adstock* for an ad aired in March and April would have been: Ad1_April GRP +

(Ad1_March GRP * 0.5). Each brand had an exposure score (*brand exposure*) calculated by summing the *adstock* scores of all sample ads by brand.

Prevalence of Youth Consumption. The prevalence of youth brand-specific alcohol consumption was defined as the proportion of ABRAND respondents who reported consuming a brand of alcohol in the past 30 days.

Prevalence of Adult Consumption. The prevalence of adult brand-specific alcohol consumption was defined as the proportion of GfK MRI respondents who reported consuming a brand of alcohol in the past 30-days (for flavored alcoholic beverages and spirits) or 7-days (for beer and wine).

DATA ANALYSIS

Stata version 12 was used for all analyses. Descriptive statistics (frequency, means and correlations) were performed. The study hypotheses were tested using multivariate linear regression with youth prevalence of consumption as the dependent variable (*see table 3.3*). Brand PYCA score, brand exposure score and adult consumption were independent variables in all regression equations and beta coefficients were all standardized. Following the main effects, the interaction terms were entered individually in a separate block to partial out the main effects and control for multicollinearity (Cohen & Cohen, 1983). I use the Aiken and West method to depict the nature of the interactions (Aiken & West, 1991).

RESULTS

Preliminary Analysis

Brand exposure scores. In a bivariate analysis, brand exposure scores were found not to have a linear relationship with prevalence of youth consumption. This is consistent with literature suggesting the response curve of

advertising to sales is nonlinear (Ackoff & Emshoff, 1975; Wind & Sharp, 2009). Figure 3.1 shows a scatterplot of the unadjusted relationship between prevalence of consumption and brand exposure with locally weighted scatterplot smoothing of the regression line. The shape suggested a quadratic term might appropriately fit the data. Following Berry and Feldman's (1985) recommendation, terms were computed for brand exposure score squared, brand exposure score cubed and brand exposure score to the fourth power. In an initial model, brand exposure and brand exposure squared had no association with youth prevalence of consumption. All polynomial terms and brand exposure score were then included in a simultaneous nested multiple linear regression model with youth prevalence of consumption as the outcome. A likelihood ratio test indicated that adding any of the polynomial terms to the model would not significantly improve the fit compared to the model with brand exposure score alone.

Because the brands were sampled based on popularity and results from study 2 indicated differences in the association between content and consumption by popularity, it was thought that separating by popularity grouping would better approximate the natural relationship. Figure 3.2 shows separate scatterplots of exposure and consumption by popularity grouping with fitted regression lines. Among the popular brands exposure appeared to have a negative relationship with prevalence and among the unpopular brands a positive relationship with prevalence. Tests of the study hypotheses were therefore conducted separately for popular brands and unpopular brands.

Correlations. Table 3.1 shows the correlations between the primary predictors and youth consumption outcome measure by popularity group. Among

the popular brands, only brand PYCA score was correlated with youth consumption ($r=.35$, $p < .05$). Among the unpopular brands, brand exposure score was correlated with youth consumption ($r=.42$, $p < .01$) and adult consumption ($r=.63$, $p < .01$), and brand PYCA score was negatively correlated with adult consumption ($r=-.39$, $p < .05$).

Descriptive Statistics

Table 3.2 shows each brand's mean and total exposure score, calculated as the mean adstock score for all ads aired by each brand and the sum total adstock scores for all ads aired by each brand. Summing adstock to use as an exposure score is consistent with the assumption that advertising exposure has an accumulating effect (Broadbent, 2000). The brand exposure scores (sum total) ranged from 0.21 (Daily's premixed cocktails) to 67.19 (Absolut Vodka).

Multivariate Linear Regression Models

Results of hierarchical regression equations used to test the hypotheses are shown in table 3.3. The predictive effect of brand exposure score on youth prevalence of alcohol consumption was tested, adjusting for adult consumption and brand PYCA score among popular brands and unpopular brands. Whether brand PYCA score modified the main effect of exposure on youth consumption was also tested through an interaction term. The interpretation of the models was based on the magnitude and direction of point estimates from beta coefficients and confidence intervals for primary predictors.

Hypotheses 1 & 2

The first hypothesis predicted a main effect of exposure on consumption, and the second predicted a main effect of PYCA on consumption adjusting for

youth exposure. Results of regression equations used to test these hypotheses separately among popular and unpopular brands are shown in table 3.3.

In the baseline model, brand exposure was not associated with youth consumption among popular brands but had a positive association with youth consumption among unpopular brands ($\beta = .39, p < .01$).

Adding brand PYCA score to the equation, among popular brands, PYCA was positively associated with youth consumption ($\beta = .45, p < .01$), and exposure was moderately negatively associated with youth consumption ($\beta = -.25, p = .06$). Among unpopular brands, PYCA was not associated with youth consumption, and exposure was positively associated with youth consumption ($\beta = .39, p < .01$).

The full model included exposure, adult consumption and brand PYCA score as covariates. In this model, brand exposure was negatively associated with youth consumption among both the popular brands ($\beta = -.14, p < .01$) and the unpopular brands ($\beta = -.25, p < .05$).

To identify the covariate responsible for the change in direction of exposure's association with consumption among unpopular brands, a model with exposure and adult consumption as covariates (excluding PYCA score) was assessed. Brand exposure had no association with youth consumption adjusting for adult consumption. Given exposure had a positive association adjusting for PYCA alone, and a negative association adjusting for both, this suggests that accounting for both adult consumption and PYCA together contributed to the change in direction.

Hypothesis 3

The third hypothesis predicted an interaction effect between brand exposure and brand PYCA score on consumption. Among popular brands, the interaction between brand exposure and brand PYCA score was nonsignificant, however among the unpopular brands there was a significant interaction ($\beta = .50$, $p < .05$). In order to model the relationship, the interaction terms were centered and standardized and four groups were created – brands with low PYCA and low exposure, low PYCA and high exposure, high PYCA and low exposure and high PYCA and high exposure. This follows the Aiken & West method of modeling the relationship through analysis of covariance (ANCOVA) tests at one standard deviation above the mean PYCA score (the low PYCA group) and at one standard deviation below the mean PYCA score (the high PYCA group) (Aiken & West, 1991). New interaction terms were created using the new low and high PYCA variables and brand exposure. In the resulting equations, the intercepts are interpreted as alcohol brand consumption when exposure is 0, which, because exposure was standardized represents low exposure, and the addition of the intercept and the interaction term coefficient is interpretable as alcohol brand consumption when exposure is 1 (high exposure). Figure 3.3 shows the depictions of these relationships among popular and unpopular brands after controlling for adult consumption, as in the regression analyses. Because the outcome variable, youth prevalence of consumption, was transformed the y-axis is not to be interpreted beyond magnitude of change.

Among popular brands, there was no moderating effect of content on the relationship between exposure and consumption. There was very little difference

in consumption when exposure was high versus low, but there was a significant difference in consumption comparing low versus high PYCA scores.

Among the unpopular brands, consumption rose as exposure went from low to high among brands with high PYCA scores. However, consumption decreased as exposure went from low to high among brands with low PYCA scores. In other words, when brands were unpopular, greater exposure to ads with youthful content was associated with greater consumption and lesser exposure to ads with higher youthful content was associated with greater consumption.

DISCUSSION

This study provides a telling look at the relationship between youth drinking and brand exposure, offering a possible explanation for the mixed findings on how exposure to alcohol marketing contributes to the problem of youth alcohol consumption in the United States.

It was initially surprising to find that the main effect of brand exposure on consumption was significantly negative among the most popular brands, suggesting that as a brand advertises more, youth drink less of that brand. However, the comparison between the marketing activities of the most popular brands and the unpopular brands offers a compelling possible explanation. Among unpopular brands, as a brand advertised more heavily using more PYCA elements, more youth drank that brand. Adding PYCA to the model compared to the model with adult consumption and brand exposure alone increased the explained variance in youth consumption patterns by 7.3% ($p < .05$). This signifies that high exposure of highly youth-appealing content is associated with

youth consumption and suggests that these are brands on their way to becoming popular among youth. However, among brands already popular with youth, it may be that they no longer need to advertise heavily to maintain their youth market share. In fact, based on the interaction modeling, it appeared that heavy exposure of an already popular brand had, if anything, a negative effect on youth consumption. This would be supported by the Vidale-Wolfe model, which posits that advertising can reach a saturation point, after which advertising effects stabilize or decrease (Vidale & Wolfe, 1957). Other research has similarly found a nonlinear relationship between advertising exposure and sales where the effects of high exposure rise and then either stabilize or diminish sales (Ackoff & Emshoff, 1975; Wind & Sharpe, 2009). Assuming brands know what their youth market share is, decreasing advertising exposure among that demographic would serve to save money, not threaten their sales with saturation, and be a way to provide evidence that they are not intentionally targeting youth. Instead, what determined whether youth drank more or less of a brand regardless of popularity was whether the brand ads had primarily youthful content appeal (PYCA). Among the unpopular brands, high exposure with low PYCA had the lowest consumption rates. This is perhaps a case in point of repeated exposure exerting a compounding effect of the unappealing content, in which youth, thoroughly unconvinced by the ad appeal, actively reject that brand.

These findings suggest that what is needed to garner youth market share is exposure to ads with primarily youthful content appeal, and what is needed to maintain brand loyalty among youth is persuasive exposure in small quantities. In a bivariate model of youth consumption of just the popular brands, it appeared

that brands' exposure to youth increased up to approximately 7% youth prevalence of consumption, after that brand exposure declined even though youth consumption continued to rise or remain stable (*see figure 3.1*). More robust analysis is needed, but this cutoff could represent the point at which a brand has garnered enough brand loyalty to maintain it independent of repeated exposure.

Limitations

One important limitation of this study is that in drawing a connection between content and consumption, I assume that the respondents were either exposed to the ad itself or ads with very similar content appeal. Brands did tend to maintain their "personality" across ads, and maintaining consistency in brand personality and brand message is good marketing practice (Cohen, 2014), but I cannot assume any causality between content and consumption. More work that looks into the variation of content and style in ads by brand over time is needed. Similarly, adstock is a measure of potential exposure, not documented exposure, and adstock is limited to the television viewing audience (cable or broadcast) whereas youth may be fast-forwarding or using digital streaming services to watch TV programs that may show different advertisements. However research shows that of youth age 8-18 who watch TV, only 8% DVR and only 9% watch online (Kaiser Family Foundation, 2010), and there is a precedent in the literature for using adstock (Wakefield et al. 2006; Siegel et al. 2014).

The cross-sectional design of the study also limits the ability to establish a causal association between exposure, content and consumption. However, the comparison between brands popular and unpopular among youth shows brands

at various stages of earning youth market share, illustrating that content is key to that process. In addition, social cognitive theory and cultivation theory hold that because of the perpetual feedback loop of media relying on the audience to create content and the audience reflecting that media content in real life, the question of causality may be less crucial in this case (Bandura, 1986; Gerbner et al. 1986).

This study is conducted at a population level, with the proportion of youth who reported consuming a brand as the outcome. Consequently, inferences about the findings cannot be extended to the individuals who make up the population of interest. Replicating the analyses on a non-aggregate level with individual youths could allow for a dose-response relationship between exposure, content and consumption to be modeled.

Further research is needed, especially around how alcohol marketing affects youth who have not yet initiated drinking behaviors, whether marketing contributes to differences in drinking quantity, such as moderate versus heavy drinking, and further explication of the moderators of the relationship between content and consumption. For instance, this project did not deal with product pricing, whether youth chose the brands they reported consuming, or brand availability as factors driving differential brand consumption. Though the most consumed brands among youth varied widely by price (i.e. Bud Light beer and Grey Goose vodka), price has been shown to influence purchasing decisions of youth (Wagenaar, Salois and Komro, 2009). Among ABRAND respondents, 56% of youth reported they themselves or another person under age 21 chose the brand they drank most recently and 32% reported someone over age 21 made the choice (weighted proportions). Besides brand availability constraining youth

choice, brands may advertise more heavily in markets where the product can be more available due to distribution capacity or state policies and control of alcohol. This could lead to a false association between exposure to advertising and youth consumption. These factors all need to be considered in future research.

Public Health and Policy Implications

This research project also has broad strengths and significant public health and policy implications. Most importantly, the finding of a strong association between content appeals and underage drinking suggests that through a combined effort of advertisement placement and content regulation we could have a significant impact on underage drinking, saving lives and preventing alcohol-related harms in this population and more broadly.

Regarding the mechanisms of the regulatory guidelines, this research suggests a necessary metric is the nature of the content. Among both popular and unpopular brands content was the driving force of the association of an ad with youth consumption. In fact, high exposure to ads unappealing to youth holds promise as a way to discourage youth from drinking. In accordance with the Institute of Medicine (IOM) recommendation 7-3, ad content can be improved at three stages: before ad creation, in ad placement, and after ad airing: “the alcohol industry...should strengthen their advertising codes to preclude placement of commercial messages in venues where a significant proportion of the expected audience is underage, to prohibit the use of commercial messages that have substantial underage appeal, and to establish independent external review boards to investigate complaints and enforce the codes” (Bonnie et al. 2004, p. 139).

Improving ads before ad creation requires stronger, more comprehensive guidance in the alcohol industry codes on appropriate content. This is the first study to examine the differential association between appeals and youth versus adult drinking and the findings put into question the assumption that the content of these advertisements is equally attractive to adults. The industry guidelines should reflect what has been shown in the expansive research literature, in theory of media effects, and in this project to be appealing to youth, and the industry should decrease the number and type of primarily youthful content appeals used in its marketing and promotions.

Restricting ad placement based on audience composition is the easiest and most effective means of reducing youth exposure. However, research has found that the current threshold for proportion of the audience that can be underage is being violated. One study found that 7.5% of all alcohol ads aired in 2009 were placed on programming with youth audiences exceeding the 30% threshold at the time (CAMY, 2012), and in an examination of the audience breakdown locally, rather than nationally, almost 24% of alcohol ad placements on the top 10 most popular TV programs among youth violate the audience threshold (CDC, 2013). A lower threshold youth audience size has been recommended by the National Research Council and the IOM (2004), and augmenting this approach, ads containing youth-appealing content should have stricter placement restrictions. One option involves monitoring content for adherence to industry codes before ad placement. There are questions of feasibility around regulating content prior to ad publication, but my experience coding ad content for this project leads me to believe the issue should be revisited. Ad spots sampled for this project were on

average 26 seconds long, and with practice ad coding time took only a few minutes. Abbreviating the PYCA codebook by identifying codes less appealing to youth through experiments and confirmatory factor analyses would lessen coding time further. In practice, ads found by a monitor to have an unacceptable PYCA score could be relegated to a certain subset of TV programs or air times with youth audience composition less than 15% per the suggestion of the National Research Council and Institute of Medicine (2004).

Finally, there should be ongoing monitoring and surveillance of brand-specific ad content and placement to impose a measure of accountability on brands and marketers.

This research has significant and long-term implications for informing youth-appropriate prevention strategies and interventions to address the problem of underage drinking. Fundamentally, it can inform parents, schools, and interventions broadly on how to counter the appeal of desirable and seemingly realistic alcohol portrayals in the media, such as increasing skepticism about the models and the rewards shown for drinking in ads.

Conclusion

This study fills in many gaps in our understanding of the underlying relationship between exposure and underage drinking. The findings support previous research that has suggested testing for a non-linear relationship between exposure and consumption, and emphasizes the importance of the role of advertising content in the relationship between youth exposure to alcohol advertising and underage drinking.

Chapter Six: Conclusions

The findings of these investigations, which are the first to triangulate youth exposure, advertisement content and youth consumption data, add a new dimension to our understanding of the underlying process of how exposure to advertising could lead to changes in alcohol consumption among under-aged youth. First, it is clear that content matters. This is consistent with marketing research showing that advertising's immediate effect can be large and is largely dependent on creative content (Wind & Sharp, 2009). Study 1 involved a comprehensive literature review of content persuasive to youth and developed the PYCA scale. The construct of primarily youthful content appeal, or PYCA, is one that is policy-oriented in its attention to both the research literature and the alcohol industry's marketing guides. Study 2 showed that the PYCA scale is significantly more accurate and comprehensive than what is currently used by the industry. The industry codes should be revised to reflect this scale and the scale can be used in ongoing monitoring and future research projects to bring consistency to the methods and measures with which we study the persuasive effects of advertising on youth.

Taking advantage of a unique opportunity to utilize cutting-edge, innovative datasets from ABRAND, Nielsen and the GfK MRI Survey of the American Consumer, the project findings add much to the nascent body of work that explores marketing activities and alcohol consumption on the brand level. The mixed literature on exposure to alcohol marketing and youth drinking patterns had not accounted for brand-specific preferences among youth, and this project indicates that marketing activities differ based on brand. There was very little difference in drinking rates comparing low to high exposure among the

popular brands, and among the unpopular brands a critical factor was whether the ad included PYCA. Going forward, conducting brand-specific research is crucial to exploring the impact of marketing on youth.

Finally, it is clear that youth are not passive viewers of marketing, and according to theory, the literature on youth-specific developmental vulnerabilities around marketing, and this research, the use of primarily youthful content appeal in ads strengthens the relationship between exposure to alcohol advertisements and underage drinking. Knowing this is a first step toward empowering researchers, public health practitioners, policy makers and community members to counter the effects of persuasive advertising and improve health outcomes for youth.

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Study concept and design: Padon, Rimal, Jernigan, Siegel, Naimi, Ross

Acquisition of data: Padon, Siegel, Ross, Jernigan

Analysis and interpretation of data: Padon, Rimal, Jernigan, Ross, Naimi

Drafting of the manuscript: Padon

Critical revision of the manuscript for important intellectual content: Rimal

Statistical analysis: Padon

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Study supervision: Rimal, Jernigan

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TABLE 1.1: Prevalence of Past 30-day Consumption of the top 25 Alcohol Brands among Youth^a

Brand	Use in past 30 days^b	Brand	Use in past 30 days^b
1. Bud Light	27.9%	14. Bacardi Malt	8.0%
2. Smirnoff Malt	17.0%	15. Jose Cuervo	8.0%
3. Budweiser	14.6%	16. Miller Lite	7.4%
4. Smirnoff Vodkas	12.7%	17. Grey Goose	6.7%
		Vodkas	
5. Coors Light	12.7%	18. Malibu Rums	6.3%
6. Jack Daniel's	11.4%	19. Four Loko	6.1%
7. Corona Extra	11.3%	20. Keystone Light	6.0%
8. Mike's Hard	10.8%	21. Hennessy	5.6%
Lemonade		Cognac	
9. Captain Morgan	10.4%	22. Patron	5.5%
Rums		Tequilas	
10. Absolut Vodkas	10.1%	23. Bailey's Irish	5.2%
		Cream	
11. Heineken	9.7%	24. Corona Extra	5.2%
12. Bacardi Rums	9.3%	25. UV Vodkas	5.1%
13. Blue Moon Beer	8.2%		

Notes: Proportions in the table are weighted.

^a Top 25 brands among youth, according to 30-day prevalence among youth drinkers (age 13-20); ABRAND survey, 2012.

^b Prevalence of past 30-day consumption among youth (age 13-20); ABRAND survey, 2012.

TABLE 1.2 Top 20 Popular Television Shows among Youth^a

1. Tosh.O	11. Comedy Central Presents
2. Law and Order: SVU	12. The Colbert Report
3. Deadliest Warrior	13. Dirty Jobs
4. DVD on TV	14. King of Queens
5. NCIS	15. CSI
6. Mythbusters	16. Ultimate Fighter Unleashed
7. Two and a Half Men	17. Chelsea Lately
8. The Daily Show	18. Lopez Tonight
9. 1000 Ways to Die	19. Ghost Adventures
10. The Office	20. Man v. Food

^a Notes: Source: Nielsen (New York, NY); Top 20 TV shows ranked by average audience size of 12-20 year olds for 2010-2011.

TABLE 1.3: Descriptive Statistics of PYCA Codes in Ads (n=96)			
Category	Content Element	# ads with code (%)	Mean (SD)
Production Value	Animation (0-2)	22 (22.92)	0.33 (0.66)
	Edits (count)	94 (97.92)	15.39 (11.04)
	Pace (edits/duration)	94 (97.92)	0.56 (0.30)
	Sound Saturation (0, 1)	95 (98.96)	NA
	Loud & Fast Music (0, 1)	6 (6.25)	NA
	Second-half Punch (0, 1)	9 (6.25)	NA
	Intense Images (0, 1)	0	NA
Character Appeal Main, Additional & Voice over	Real or Animated (0, 1)	15 (15.63)	NA
	Human or Animal (0, 1)	18 (18.75)	NA
	Adult or Youth (0, 1)	6 (6.25)	NA
	Celebrity or Unknown (0, 1)	17 (17.71)	NA
	Fictional Spokesperson (0, 1)	8 (8.33)	NA
	Gender: Male (count)	77 (80.21)	3.19 (3.46)
	Gender: Female (count)	69 (71.88)	1.89 (2.16)
	Race: White (count)	79 (82.30)	3.93 (3.90)
	Race: Black (count)	35 (36.46)	0.66 (1.12)
	Race: Hispanic (count)	16 (16.67)	0.26 (0.70)
	Race: Asian (count)	10 (10.42)	0.22 (1.0)
	Magic (0-2)	10 (10.42)	0.15 (0.46)
	Fantasy (0-2)	9 (9.38)	0.11 (0.38)
	Violence (0-2)	1 (1.04)	0.01 (0.10)
Youth-Oriented Theme	Humor (0-2)	37 (38.54)	0.43 (0.58)
	Story Format (0-2)	29 (30.21)	0.33 (0.54)
	Physical Benefits (1, 0)	37 (38.54)	NA
	Health (1, 0)	12 (12.50)	NA
Product Appeals	Qualities (1, 0)	38 (39.58)	NA
	Properties (1, 0)	27 (28.12)	NA
	Composition (1, 0)	23 (23.96)	NA
	Competitive (1, 0)	19 (19.79)	NA
	Bonus offers (1, 0)	0	NA
	Value (1, 0)	0	NA
Emotional Appeals	Happiness/Fun (0-2)	84 (87.50)	1.38 (0.70)
	Physical Performance (0-2)	40 (41.67)	0.58 (0.76)
	Adventure/Spontaneity (0-2)	36 (37.50)	0.55 (0.78)
	Achievement/Success (0-2)	61 (63.54)	0.96 (0.83)
	Sexual Connotation (0-2)	34 (35.42)	0.5 (0.74)
	Romantic Connotation (0-2)	14 (14.58)	0.17 (0.43)
	Individuality (0-2)	46 (47.92)	0.81 (0.91)
	Camaraderie (0-2)	66 (68.75)	1.06 (0.83)
	Social Positioning (0-2)	49 (51.04)	0.86 (0.91)
Risk Content	Injury (0, 1)	31 (32.29)	NA
	Overconsumption (0, 1)	13 (13.54)	NA
	Addiction (0, 1)	15 (15.62)	NA
Industry Codes	Santa Claus (0, 1)	0	NA
	Branded Kid Items (0, 1)	0	NA
	Rite of Passage (0-2)	0	NA

Notes: NA refers to dichotomous codes for which mean and standard deviation were uninformative.

TABLE 1.4: Descriptive Statistics of Ads by Brand (n=41)

Brand	# of ads (%)	Mean Duration in seconds (SD)	Mean PYCA score (SD)	Popularity^a	Brand Type^b
Jack Daniels	2 (2)	29 (0)	22.1 (1.5)	1	Liquor
Whiskey					
Heineken	2 (2)	59 (0)	19.0 (12.6)	1	Beer
Absolut Vodkas	2 (2)	27.5 (0.7)	17.7 (26.3)	1	Liquor
Smirnoff Vodkas	3 (3)	19 (8.7)	14.9 (12.2)	1	Liquor
Mike's Lemonade	4 (4)	25.3 (7.5)	7.0 (4.9)	1	Beer
Bacardi Rums	1 (1)	29	6.24	1	Liquor
Bud Light Beer	6 (6)	29 (0)	5.4 (8.5)	1	Beer
Captain Morgan					
Rum	1 (1)	28	5.39	1	Liquor
Miller Lite	4 (4)	28.5 (0.6)	3.0 (6.9)	1	Liquor
Corona Extra	1 (1)	14	1.78	1	Beer
Coors Light	3 (3)	29 (0)	0.65 (7.7)	1	Beer
Grey Goose Vodkas	4 (4)	20.5 (9.8)	-5.6 (4.9)	1	Liquor
Hennessy Cognac	1 (1)	58	13.0	1	Liquor
Budweiser	1 (1)	30	-2.59	1	Beer
Blue Moon	4 (4)	25.3 (7.5)	-5.7 (7.1)	1	Beer
Patron Tequilas	4 (4)	21.5 (8.1)	-12.9 (4.5)	1	Liquor
Baileys Irish Cream	2 (2)	22 (10.6)	-2.0 (3.1)	1	Liquor
Guinness Beer	2 (2)	14.5 (0.7)	-16.2 (5.6)	1	Beer
Dos Equis	3 (3)	19 (8.7)	8.1 (1.3)	0	Beer
Svedka Vodka	1 (1)	29	7.5	0	Liquor
Grand Marnier	5 (5)	20 (8.2)	10.0 (9.1)	0	Liquor
Maker's Mark	3 (3)	28.3 (0.6)	8.2 (1.9)	0	Liquor
Russian Standard	2 (2)	29 (0)	4.8 (3.3)	0	Liquor
Stella Artois	4 (4)	29 (0)	3.0 (12.4)	0	Beer
Yellow Tail	1 (1)	27	2.3	0	Wine
Newcastle Beer	1 (1)	28	0.25	0	Beer
Michelob Ultra	4 (4)	38.5 (0.6)	-0.7 (13.4)	0	Beer
Pinnacle Vodkas	3 (3)	34 (22.9)	-0.99 (3.6)	0	Liquor
Avion Tequila	2 (2)	21 (9.9)	-1.80 (5.2)	0	Liquor
Ketel One Vodka	1 (1)	28	-2.6	0	Liquor
Disaronno Liqueur	1 (1)	12	-2.7	0	Liquor
Johnnie Walker	2 (2)	28.5 (0.7)	-4.0 (2.1)	0	Liquor
Coors	1 (1)	29	-7.81	0	Beer
Kahlua Liqueurs	1 (1)	30	-11.2	0	Liquor
Samuel Adams	7 (7)	26.9 (5.7)	-12.1 (5.4)	0	Beer
Southern Comfort	1 (1)	28	-12.2	0	Liquor
Daily's Cocktails	1 (1)	29	-14.6	0	Beer
Sauza Tequila	1 (1)	16	-15.3	0	Liquor
Budweiser Select	1 (1)	29	-18.87	0	Beer
Korbel Champagne	2 (2)	30 (0)	-19.1 (1.7)	0	Wine
Cavit Wines	1 (1)	14	-32.78	0	Wine

Totals:**By Popularity:**

Popular Brands N (%) or M (SD)	47 (49%)	26.89 (10.65)	2.7 (10.16)	--	--
Unpopular Brands N (%) or M (SD)	49 (51%)	26.08 (7.88)	-2.72 (9.93)	--	--
Popular vs Unpopular <i>t</i> (df)	-0.27 (88)	-0.42(85)	-2.61 (94)*	--	--
By Alcohol Type:					
Beer Brands N (%) or M (SD)	49 (51%)	27.71 (8.54)	-0.75 (8.74)	--	--
Liquor Brands N (%) or M (SD)	43 (45%)	25.19 (10.22)	2.45 (10.26)	--	--
Wine Brands N (%) or M (SD)	4 (4%)	25.25 (7.63)	-17.14 (14.50)	--	--
Beer vs Other <i>t</i> (df)	-4.31 (87)***	-1.33 (94)	0.72 (84)	--	--

Notes: Satterthwaite's degrees of freedom given when groups had unequal variances.

^a Popularity grouping: 1 = Popular (within the top 25 most consumed brands among youth), o = Unpopular (within the remaining brands); based on prevalence of youth consumption data from the ABRAND survey, 2012.

^b Type of alcohol grouped cordials and liqueurs into liquor, flavored alcoholic beverages and cocktail mixers into beer, and champagnes into wine based on alcohol content by volume.

p* < .05 *p* < .01 ****p* < .001

TABLE 2.1: Prevalence of Consumption of Youth and Adults for the Top 25 Alcohol Brands among Youth^a

Brand	% Youth Drinking^b	% Adult Drinking^c	Brand	% Youth Drinking^b	% Adult Drinking^c
Bud Light	27.9%	13.24%	Bacardi Malt	8.0%	3.58%
Smirnoff	17.0%	6.13%	Jose Cuervo	8.0%	5.31%
Budweiser	14.6%	10.34%	Miller Lite	7.4%	4.67%
Smirnoff	12.7%	3%	Grey Goose	6.7%	4.7%
Vodkas			Vodkas		
Coors Light	12.7%	5.52%	Malibu	6.3%	1.94%
Jack Daniel's	11.4%	3.96%	Rums		
Corona	11.3%	5.22%	Four Loko	6.1%	N/A
Extra			Keystone Light	6.0%	0.63%
Mike's Hard	10.8%	5.16%	Hennessy	5.6%	2.25%
Lemonade			Cognac		
Captain Morgan	10.4%	4.64%	Patron	5.5%	3.58%
Rums			Tequilas		
Absolut	10.1%	5.82%	Bailey's	5.2%	2.56%
Vodkas			Irish Cream		
Heineken	9.7%	4.5%	Corona	5.2%	2.69%
Bacardi	9.3%	6.4%	Extra		
Rums			UV Vodkas	5.1%	N/A
Blue Moon	8.2%	4.33%			
Beer					

Notes: NA refers to brands not measured in the MRI Survey of the American Consumer). Proportions in the table are weighted.

^a Top 25 brands among youth, according to 30-day prevalence among youth drinkers (age 13-20); ABRAND survey, 2012.

^b Prevalence of past 30-day consumption among youth (age 13-20); ABRAND survey, 2012.

^c Prevalence of past 7-day (beer, wine) or 30-day (flavored alcoholic beverages, spirits) consumption among adults (age 21+); GfK MRI Survey of the American Consumer, 2010-2012.

TABLE 2.2: Descriptive Statistics of Sample Brands (n=41)

Brand	Alcohol Type^a	Popularity^b	Adult Consumption^c	Youth Consumption^d	Mean PYCA score (SD)
Jack Daniels Whiskey	Liquor	1	3.96%	11.5%	22.1 (1.5)
Heineken	Beer	1	4.5%	9.7%	19.0 (12.6)
Absolut Vodkas	Liquor	1	5.82%	10.1%	17.7 (26.3)
Smirnoff Vodkas	Liquor	1	3%	12.7%	14.9 (12.2)
Hennessy Cognac	Liquor	1	2.25%	5.7%	13.0
Mike's Lemonade	Beer	1	5.16%	10.8%	7.0 (4.9)
Bacardi Rums	Liquor	1	6.4%	9.3%	6.24
Bud Light Beer	Beer	1	13.24%	27.9%	5.4 (8.5)
Captain Morgan Rum	Liquor	1	4.64%	10.4%	5.39
Miller Lite	Beer	1	4.67%	7.5%	3.0 (6.9)
Corona Extra	Beer	1	5.22%	11.3%	1.78
Coors Light	Beer	1	5.52%	12.7%	0.65 (7.7)
Baileys Irish Cream	Liquor	1	2.56%	5.2%	-2.0 (3.1)
Budweiser	Beer	1	10.34%	14.6%	-2.59
Grey Goose Vodkas	Liquor	1	4.7%	6.7%	-5.6 (4.9)
Blue Moon Beers	Beer	1	4.33%	8.2%	-5.7 (7.1)
Patron Tequilas	Liquor	1	3.58%	5.5%	-12.9 (4.5)
Stella Artois Beer	Beer	0	1.85%	1.2%	3.0 (12.4)
Grand Marnier	Liquor	0	0.58%	0.2%	10.0 (9.14)
Maker's Mark	Liquor	0	1.31%	0.8%	8.2 (1.9)
Dos Equis Beer	Beer	0	1.6%	3.8%	8.1 (1.3)
Svedka Vodka	Liquor	0	1.19%	0.9%	7.5
Russian Standard Vodka	Liquor	0	0.26%	0.2%	4.8 (3.3)
Yellow Tail	Wine	0	2.97%	2.3%	2.3

Wines					
Newcastle Beer	Beer	o	1.07%	0.5%	0.25
Michelob Ultra	Beer	o	2.05%	0.8%	-0.7 (13.4)
Pinnacle Vodkas	Liquor	o	NA	2.7%	-0.99 (3.6)
Avion Tequila	Liquor	o	NA	0.0%	-1.80 (5.2)
Ketel One Vodka	Liquor	o	1.38%	0.26%	-2.6
Disaronno Liqueur	Liquor	o	0.44%	0.14%	-2.7
Johnnie Walker	Liquor	o	2.06%	1.44%	-4.0 (2.1)
Coors Beer	Beer	o	3.5%	3.83%	-7.81
Kahlua Liqueurs	Liquor	o	2.1%	2.46%	-11.2
Samuel Adams Beers	Beer	o	4.59%	3.14%	-12.1 (5.4)
Southern Comfort	Liquor	o	0.41%	0.36%	-12.2
Daily's Cocktails	Beer	o	NA	1.29%	-14.6
Sauza Tequila	Liquor	o	0.72%	0.3%	-15.3
Guinness Beer	Beer	o	2.47%	1.8%	-16.2 (5.6)
Budweiser Select	Beer	o	1.95%	2.9%	-18.87
Korbel Champagne	Wine	o	1.26%	0.5%	-19.1 (1.7)
Cavit Wines	Wine	o	0.34%	0.0%	-32.78

Notes: NA refers to brands for which there was not adult prevalence of consumption data from the GfK MRI Survey of the American Consumer, 2010-2012.

^a Type of alcohol with cordials and liqueurs grouped into liquor, flavored alcoholic beverages and cocktail mixers (based on alcohol content by volume) grouped into beer, and champagnes grouped into wine.

^b Popularity grouping: 1 = Popular (within the top 25 most consumed brands among youth), o = Unpopular (within the remaining brands); based on prevalence of youth consumption data from the ABRAND survey, 2012.

^c Prevalence of past 7-day (beer, wine) or 30-day (flavored alcoholic beverages, spirits) consumption among adults (age 21+); GfK MRI Survey of the American Consumer, 2010-2012. These proportions are weighted.

^d Prevalence of past 30-day consumption among youth (age 13-20); ABRAND survey, 2012. These proportions are weighted.

Table 2.3. Correlations among Predictors of Brand-Specific Youth and Adult Alcohol Consumption

	2	3	4	5	6	7
1. Ad PYCA Score ^a	.86***	-.05	.29**	.12	.41***	.19
2. Brand PYCA Score ^b	1.00	-.08	.34***	.14	.48***	.19
3. Type of Beverage ^c		1.00	.35***	.41***	.19	0.13
4. Youth Consumption ^d			1.00	.93***	.65***	.84***
5. Adult Consumption ^e				1.00	.42***	.73***
6. Ratio ^f					1.00	.74***
7. Popularity Group ^g						1.00

Notes: Correlations between interval variables (ad PYCA score, brand PYCA score, youth and adult consumption and ratio) are Pearson correlation coefficients and between nominal or ordinal variables (type of beverage and popularity group) are Spearman rank correlation coefficients.

^aAd PYCA score refers to the summed, standardized PYCA scores for each ad.

^bBrand PYCA score refers to the mean ad PYCA score from ads within each brand.

^cType of beverage is categorized as 1 = beer, 0 = other.

^dYouth consumption refers to the prevalence of past 30-day youth consumption of alcohol (age 13-20); ABRAND survey, 2012.

^eAdult consumption refers to the prevalence of past 7-day (beer, wine) or 30-day (flavored alcoholic beverages, spirits) adult consumption of alcohol (age 21+); GfK MRI Survey of the American Consumer, 2010-2012.

^fRatio refers to the youth prevalence of consumption relative to adult prevalence of consumption measure. The correlations between ratio and youth and adult consumption are not to be interpreted as ratio was calculated using these two variables.

^gPopularity group is categorized as 1 = Popular (within the top 25 most consumed brands among youth), 0 = Unpopular (within the remaining brands), based on prevalence of youth consumption data from the ABRAND survey, 2012. The correlation between popularity and youth consumption is not to be interpreted as popularity is calculated from the youth prevalence data.

*p < .05 **p < .01 ***p < .001

Table 2.4 Bivariate and Multivariate Linear Regression Analyses: Predictors of Prevalence of Consumption Outcomes

Outcome: Youth Prevalence of Consumption ^a				
Predictors	r ^b	Beta ^c	Total R ²	
Baseline Model:				
Brand PYCA Score ^d	0.34***	0.34**	11.3***	
Block 2:				
Brand PYCA Score ^d	0.34***	0.15***		
Adult Consumption ^e	0.93***	0.61***		
Type ^f	0.35**	0.05		
Popularity ^g	0.84***	0.40***	93.4***	
Block 3: Interaction ^h				
PYCA*Popularity		0.15***	94.4***	
Popular Brands ^g	r ^b	Beta ^c	Total R ²	
Brand PYCA Score ^d	0.35*	0.33***		
Adult Consumption ^e	0.93***	0.84***		
Type ^f	0.36*	0.002	89.8***	
Block 2: Interactions ^h				
Type*PYCA		0.01	89.9***	
Unpopular Brands ^g	r ^b	Beta ^c	Total R ²	
Brand PYCA Score ^d	-0.17	0.15		
Adult Consumption ^e	0.76***	0.70***		
Type ^f	0.62***	0.24*	69.3***	
Block 2: Interactions ^h				
Type*PYCA		0.26	72.0***	
Outcome: Adult Prevalence of Consumption ^e				
Predictors	r ^b	Beta ^c	Total R ²	
Baseline Model:				
Brand PYCA Score ^d	0.14	0.13	1.6	
Block 2:				
Brand PYCA Score ^d	0.14	-0.15***		
Youth Consumption ^a	0.93***	0.76***		
Type ^f	0.41***	0.20***		
Popularity ^g	0.73***	0.17**	86.0***	
Block 3: Interaction ^h				
PYCA*Popularity		0.04	86.0***	
Outcome: Youth : Adult Prevalence Ratio of Consumption ⁱ				
Predictors	r ^b	Beta ^c	Beta ^j	Total R ²
Baseline Model:				
Brand PYCA Score ^d	0.48***	0.47***	0.48***	22.1***
Block 2:				
Brand PYCA Score ^d	0.48***	0.31***	0.33***	
Type ^f	0.19	0.10	0.04	
Popularity ^g	0.74***	0.68***	0.63***	67.2***
Block 3: Interaction ^h				
PYCA*Popularity		0.18*	0.30**	68.8***
Popular Brands ^g	r ^b	Beta ^c	Beta ^j	Total R ²

Brand PYCA Score ^d	0.65***	0.68***	0.64***	
Type ^f	0.07	-0.13	-0.17	48.9***
Unpopular Brands^g	r^b	Beta^c	Betaⁱ	Total R²
Brand PYCA Score ^d	0.18	0.28	0.22	
Type ^f	0.28	0.41**	0.38*	21.8***

^a Past 30-day prevalence of consumption of alcohol among youth (age 13-20) from the ABRAND survey, 2012.

^b Zero-order Pearson or Spearman correlations between predictors and consumption measures.

^c Standardized betas from regression equations.

^d Brand PYCA score refers to the mean PYCA score from ads within each brand.

^e Past 7- or past 30-day prevalence of consumption of alcohol among adults (age 21+) from the GfK MRI Survey of the American Consumer, 2010-2012.

^f Type refers to the brand beverage type and is coded as 1 = beer, 0 = other.

^g Popularity group is categorized as 1 = Popular (within the top 25 most consumed brands among youth (n=18 brands, 47 ads)), 0 = Unpopular (within the remaining brands (n=23 brands, 49 ads)), based on prevalence of youth consumption data from the ABRAND survey, 2012.

^h The equations in the interaction blocks included all the variables in the preceding block plus the interaction term.

ⁱ Youth:Adult prevalence ratio is youth prevalence of consumption divided by adult prevalence of consumption by brand. This dependent variable was transformed using square root.

^j Standardized betas for the untransformed Youth:Adult prevalence ratio.

*p < .05 **p < .01 ***p < .001.

Table 3.1. Pearson Correlations among Predictors of Brand-Specific Youth Alcohol Consumption

Popular Brands^a	2	3	4
1. Brand Exposure Score ^b	.01	-.23	-.13
2. Brand PYCA Score ^c	1.00	.35*	.14
3. Youth Consumption ^d		1.00	.93***
4. Adult Consumption ^e			1.00
Unpopular Brands^f	2	3	4
1. Brand Exposure Score ^b	.01	.42**	.63**
2. Brand PYCA Score ^c	1.00	-.17	-.39*
3. Youth Consumption ^d		1.00	.76***
4. Adult Consumption ^e			1.00

^a Popular brands are those ads aired by the top 25 most consumed brands among youth based on prevalence of youth consumption data from the ABRAND survey, 2012 (n=18 brands, 47 ads).

^b Brand exposure score refers to the summed adstock scores for ads by brand.

^c Brand PYCA score refers to the mean ad PYCA score for ads by brand.

^d Youth consumption refers to the prevalence of past 30-day youth consumption (age 13-20); ABRAND survey, 2012.

^e Adult consumption refers to the prevalence of past 7- or past 30-day prevalence of consumption among adults (age 21+) from the GfK MRI Survey of the American Consumer, 2010-2012.

^f Unpopular brands are those ads aired by the remaining brands, based on prevalence of youth consumption data from the ABRAND survey, 2012 (n=23 brands, 49 ads).

*p < .05 **p < .01 ***p < .001.

TABLE 3.2: Descriptive Statistics of Brands' Exposure (n=41)

Brand	Brand Mean Exposure Score (SD)^a	Brand Total Exposure Score^b
Absolut Vodkas	2.69 (2.25)	67.19
Samuel Adams Beers	0.70 (0.66)	59.06
Heineken	1.35 (1.24)	49.77
Blue Moon Beers	0.88 (0.89)	41.26
Grand Marnier	2.60 (2.32)	38.94
Grey Goose Vodkas	1.25 (1.84)	38.71
Disaronno Liqueur	3.39 (3.0)	37.26
Guinness Beer	1.73 (1.63)	34.61
Yellow Tail Wines	2.89 (3.25)	31.78
Dos Equis Beer	1.08 (0.73)	29.22
Miller Lite	1.07 (0.82)	26.76
Stella Artois Beer	1.52 (1.84)	25.77
Michelob Ultra	0.91 (0.96)	19.09
Smirnoff Vodkas	0.87 (0.90)	19.07
Sauza Tequila	1.37 (1.91)	16.49
Bud Light Beer	0.53 (0.99)	14.29
Patron Tequilas	0.78 (0.63)	12.51
Pinnacle Vodkas	0.57 (0.43)	10.34
Svedka Vodka	1.40 (1.03)	8.42
Bacardi Rums	0.88 (0.82)	7.93
Mike's Lemonade	0.56 (0.39)	7.83
Kahlua Liqueurs	0.95 (0.77)	6.62
Korbel Champagne	0.79 (0.57)	6.34
Russian Standard Vodka	1.03 (0.52)	6.17
Southern Comfort	1.01 (0.55)	6.06
Newcastle Beer	1.13 (0.75)	5.64
Captain Morgan Rum	0.56 (0.49)	5.58
Coors Beer	0.69 (0.52)	5.49
Maker's Mark	0.54 (0.19)	4.89
Johnnie Walker	1.38 (1.0)	4.13
Jack Daniels Whiskey	0.67 (0.50)	3.33
Coors Light	0.33 (0.09)	2.93
Cavit Wines	0.83 (0.92)	2.49
Budweiser	1.19 (1.24)	2.39
Hennessy Cognac	0.97 (0.11)	1.94
Budweiser Select	0.52 (0.07)	1.56
Baileys Irish Cream	0.65 (0.68)	1.30
Ketel One Vodka	0.43 (0.05)	1.29
Corona Extra	1.15 (NA)	1.15
Avion Tequila	0.29 (0.04)	0.58
Daily's Cocktails	0.11 (0.02)	0.21

Notes: Ads were limited to the same sample used in papers 1 and 2, selected based on their airing between Dec. 2011 and May 2012 on the 20 most popular TV shows during the months. NA indicates a brand aired one ad and therefore had no SD value.

^a Brand mean exposure score refers to the mean adstock score for all ads aired by each brand.

^b Brand total exposure score refers to the summed adstock scores for all ads aired by each brand.

Table 3.3. Bivariate and Multivariate Linear Regression Analyses: Predictors of Youth Prevalence of Consumption^a

Popular Brands^b	r^c	Beta^d	Total R²
Baseline Model:			
Brand Exposure ^e	-0.23	-0.24	5.8
Block 2:			
Brand Exposure ^e	-0.23	-0.14**	
Adult Consumption ^f	0.93***	0.82***	
Brand PYCA Score ^g	0.35*	0.33***	91.7***
Block 3: Interaction ^h			
Exposure*PYCA		-0.07	91.8***
Unpopular Brandsⁱ	r^c	Beta^d	Total R²
Baseline Model:			
Brand Exposure ^e	0.42**	0.39**	15.3**
Block 2:			
Brand Exposure ^e	0.42**	-0.25*	
Adult Consumption ^f	0.76***	1.05***	
Brand PYCA Score ^g	-0.17	0.25*	69.1***
Block 3: Interaction ^h			
Exposure*PYCA		0.50*	73.3***

^a Youth consumption refers to the prevalence of past 30-day youth consumption (age 13-20); ABRAND survey, 2012.

^b Popular brands are those top 25 most consumed brands among youth, based on prevalence of youth consumption data from the ABRAND survey, 2012.

^c Zero-order Pearson or Spearman correlations between predictors and consumption measures.

^d Standardized betas from regression equations.

^e Brand exposure refers to the summed adstock scores for ads by brand.

^f Adult consumption refers to the prevalence of past 7- or past 30-day prevalence of consumption among adults (age 21+) from the GfK MRI Survey of the American Consumer, 2010-2012.

^g Brand PYCA score refers to the mean PYCA score from ads within each brand.

^h The equations in Block 3 included all the variables in block 2 (brand exposure, adult consumption and brand PYCA score) plus the interaction term.

ⁱ Unpopular youth brands are the remaining brands, based on prevalence of youth consumption data from the ABRAND survey, 2012.

*p < .05 **p < .01 ***p < .001

Figure 1.1. Sampling Procedure

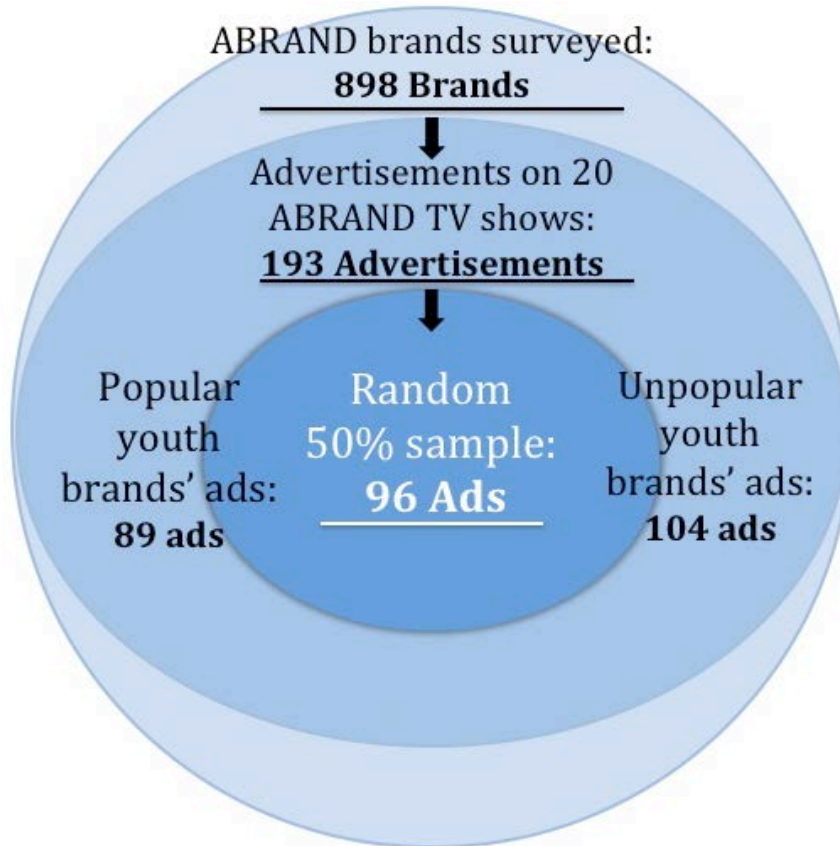


Figure 2.1. P-P Plots of Square Root Transformed Adult, Youth and Youth:Adult Prevalence of Consumption Measures

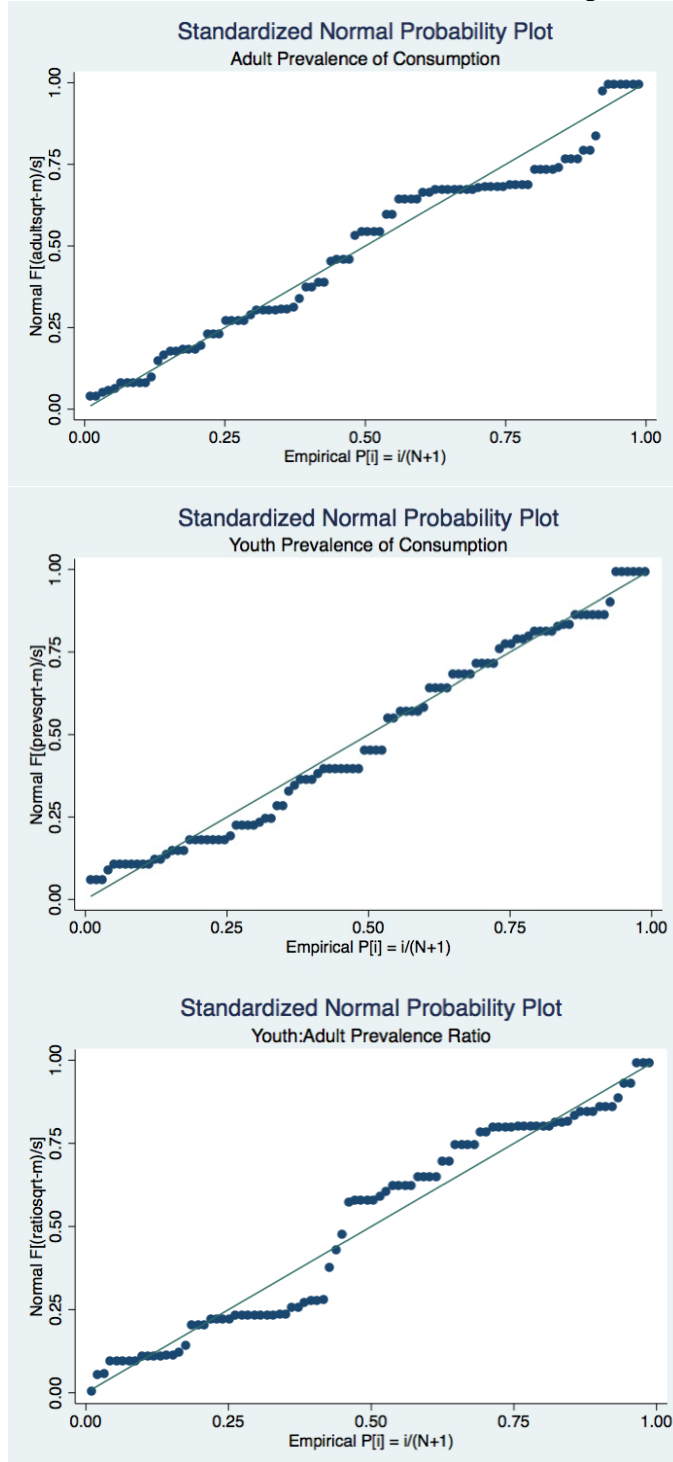


Figure 2.2. Quantile Plots of Square Root Transformed Adult, Youth, and Youth:Adult Prevalence of Consumption Measures

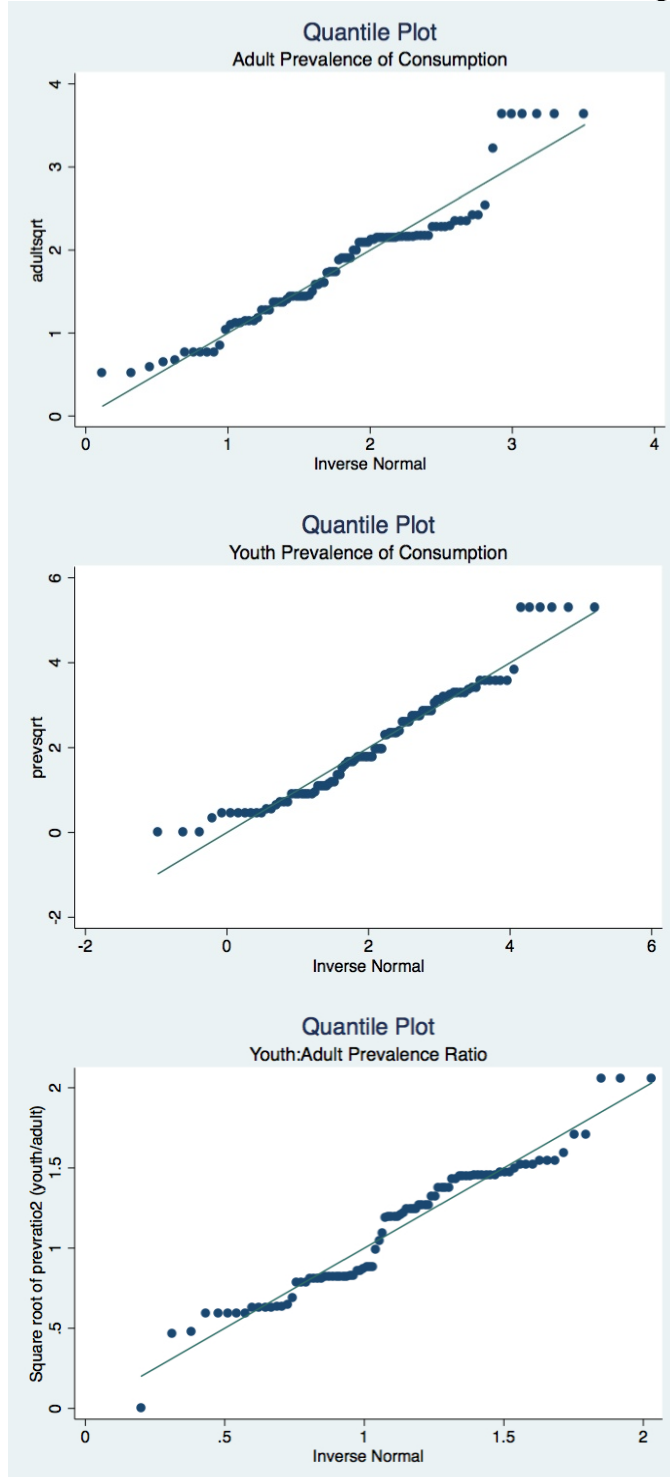
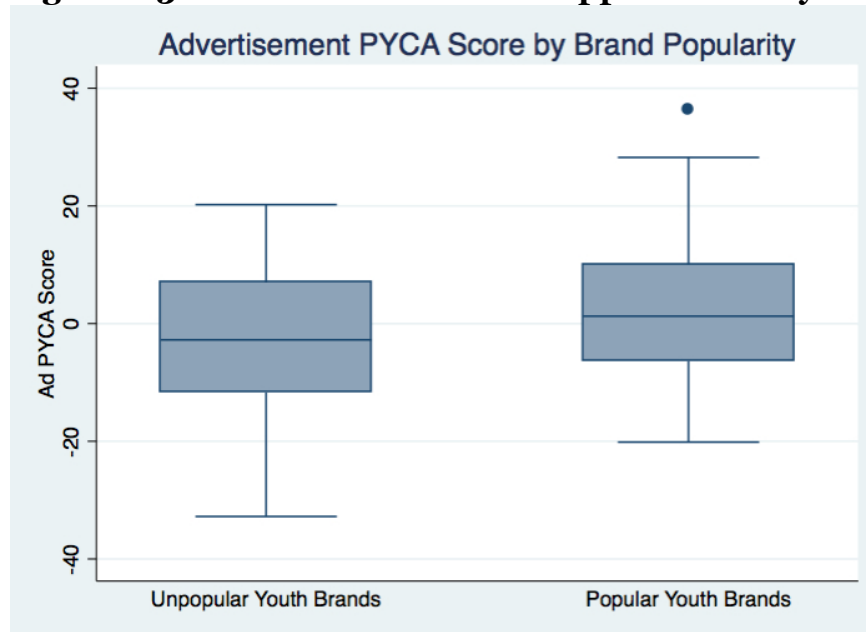
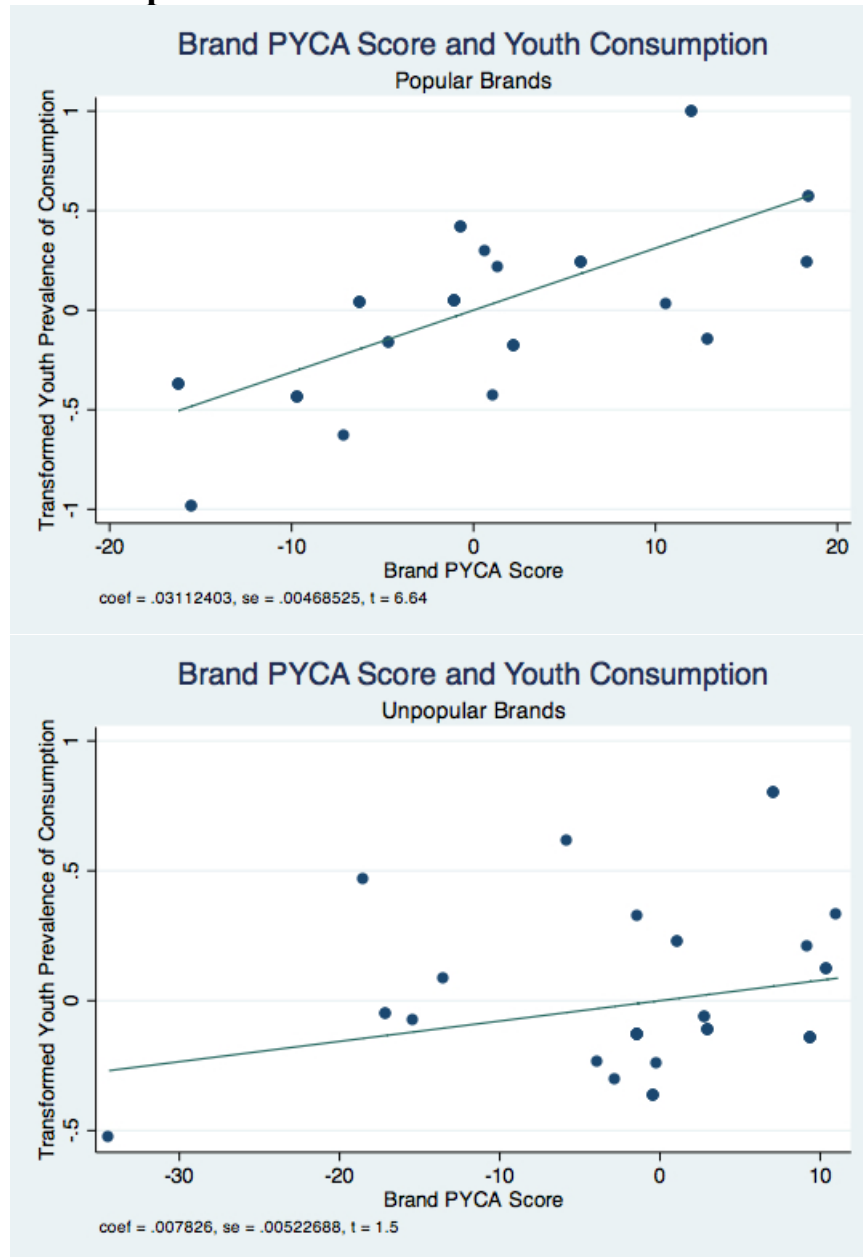


Figure 2.3. Advertisement Youth Appeal Score by Brand Popularity



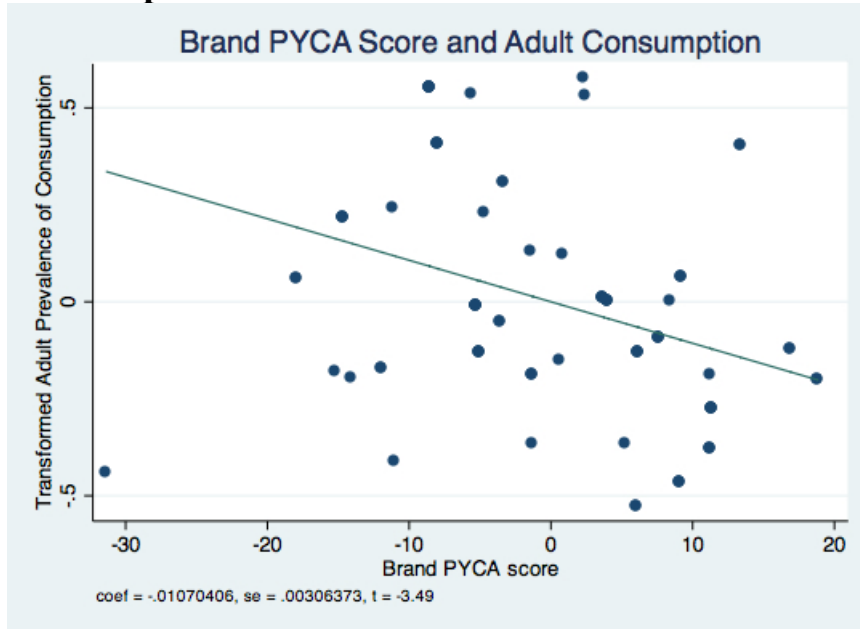
Notes: Popular Youth Brands indicates brands within the sample that fell into the top 25 brands with the highest prevalence of youth consumption and Unpopular Youth Brands indicates the brands that fell into the remaining 873 brands as measured in the ABRAND survey, 2012. Ad PYCA score is the standardized sum of all primarily youthful content elements appearing in the sample ads.

Figure 2.4. AVP of Brand PYCA Score with Youth Prevalence of Consumption



Notes: The above are added variable plots showing the relationship between an outcome (youth consumption) and a predictor variable (brand PYCA score) after controlling for any other predictors in the model. In this plot, the main effects of adult consumption and alcohol type were controlled for.

Figure 2.5. AVP of Brand PYCA Score with Adult Prevalence of Consumption



Notes: The above added variable plot shows the relationship between brand PYCA score and adult prevalence of consumption after controlling for youth consumption, popularity grouping and alcohol type.

Figure 3.1. Unadjusted Relationship Between Prevalence of Consumption and Brand Exposure

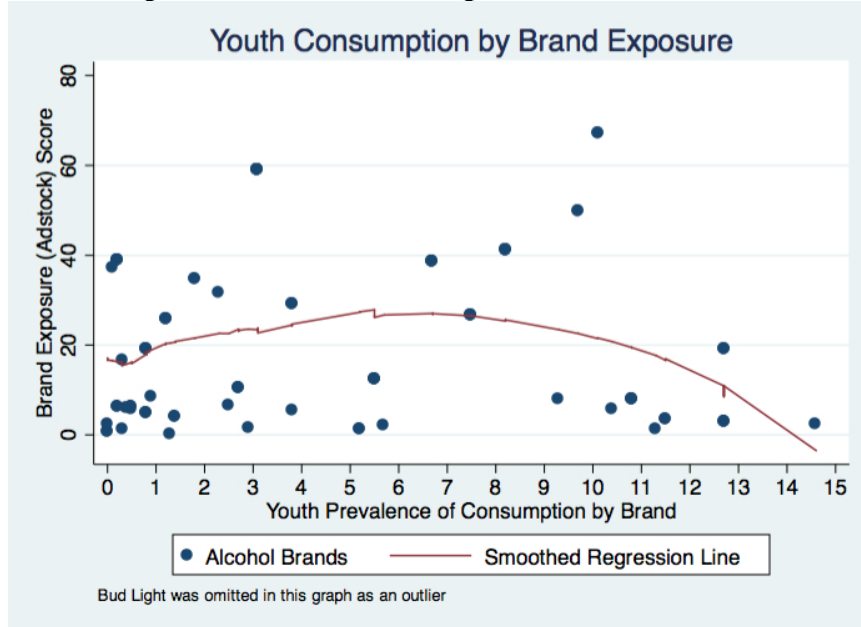
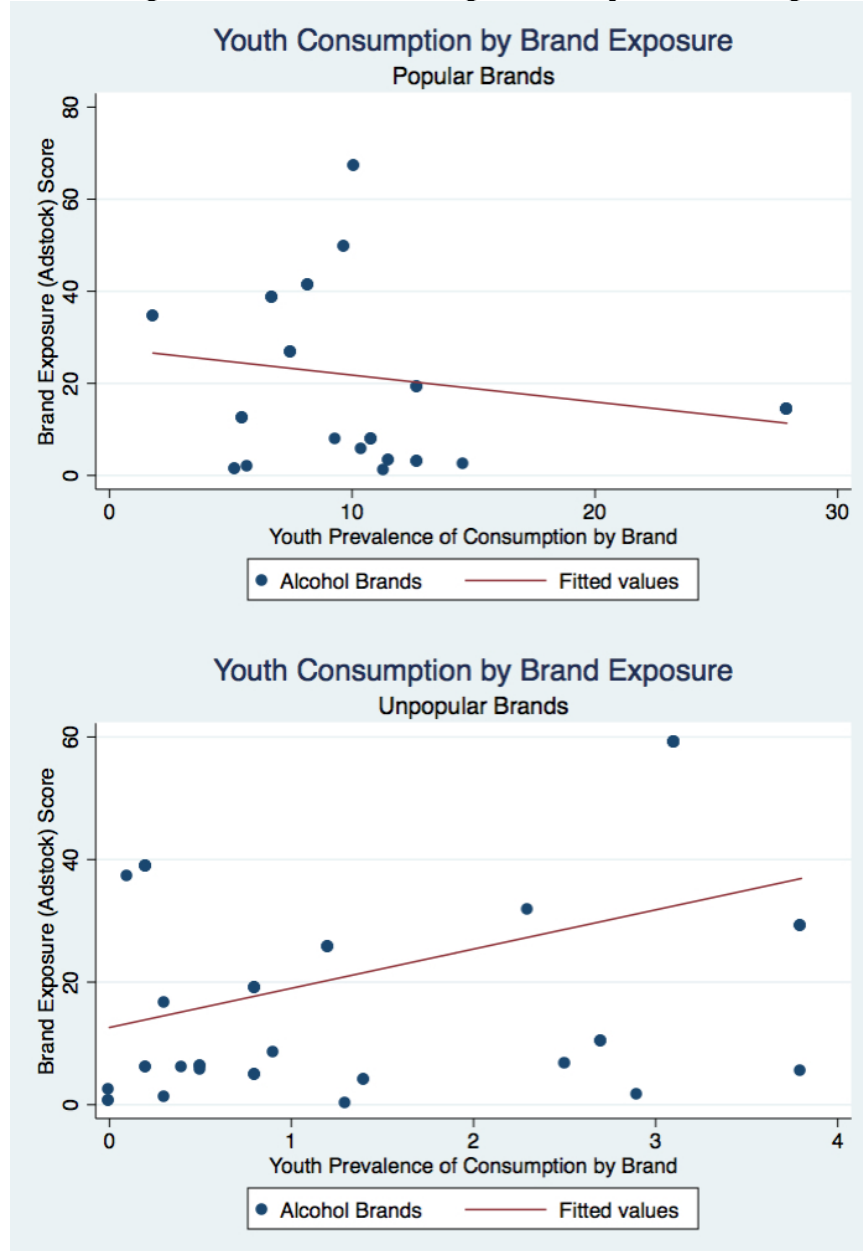
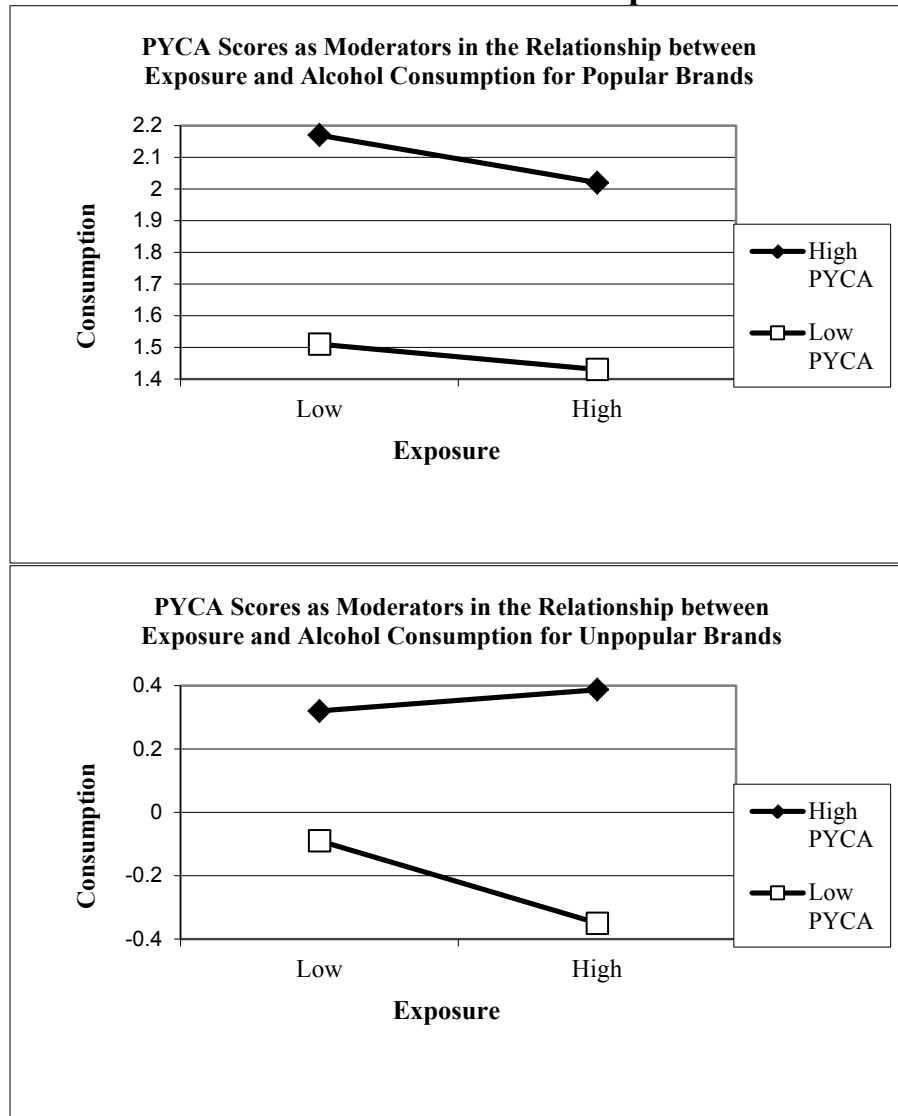


Figure 3.2. Unadjusted Relationship Between Prevalence of Consumption and Brand Exposure by Brand Popularity



Notes: These figures show scatterplots of the unadjusted relationship between prevalence of consumption and brand exposure. Popular brands are those top 25 most consumed brands among youth; Unpopular youth brands are the remaining brands, based on prevalence of youth consumption data from the ABRAND survey, 2012. Brand exposure refers to the summed adstock scores for ads by brand. Youth consumption refers to the prevalence of past 30-day youth consumption (age 13-20); ABRAND survey, 2012.

Figure 3.3. Prevalence of Youth Alcohol Consumption with Interaction Effects Between Brand Exposure and Brand PYCA Score



Notes: These figures show youth alcohol consumption (square root transformed), with interaction effects between brand exposure and brand PYCA score among popular brands (top panel), and brand exposure and brand PYCA score among unpopular brands (bottom panel). Popular brands are those top 25 most consumed brands among youth; Unpopular youth brands are the remaining brands, based on prevalence of youth consumption data from the ABRAND survey, 2012. Brand exposure refers to the summed adstock scores for ads by brand. Brand PYCA score refers to the mean PYCA score from ads within each brand.

Appendix

Content Codebook		
Category	Code	Operational Definition
Production Value ^a	Animation (none=0, partial=1, full=2)	Any cartoons, drawn/sketched images, computer generated features should be coded as animation. Do not use for introductory or conclusive shots that simply show the product or brand name.
	Edits (count)	A transition to a new camera shot.
	Duration (count)	Duration of the ad.
	Pace (Edits/Duration)	Duration of the ad divided by # of edits.
	Intense Images (No=0, Yes=1)	Inclusion of images that are intense, grotesque, disgusting, or horrifying.
	Sound Saturation (No=0, Yes=1)	The use of background noise throughout (during at least half of) the ad (e.g., street noise, crowds cheering, sound effects), rather than simply having characters talk throughout the ad or having music that plays in the background.
	Loud & Fast Music (No=0, Yes=1)	The use of loud (relative to other sounds in the ad) and fast (.120 bpm) music throughout (at least half of) the ad.
	Second-half Punch (No=0, Yes=1)	The presence of a shocking, startling, or very surprising end to the ad that a first-time viewer could not have anticipated. A second-half punch must occur in the second half of the ad.
Character Appeal Main, Additional & Voice over ^{b c d}	Real or Animated (Real=0, Animated=1)	Any characters portrayed as a cartoon, drawn/sketched, computer generated, etc. should be coded as animated.
	Human or Animal (Human=0, Animal=1)	Actual animals, anthropomorphized animals or other creatures (such as a robot or the product represented as alive) should be coded as animal.
	Adult or Youth (Adult=0, Youth=1)	Youth appearing to be under 25 . If in question, code as youth.
	Celebrity or Unknown (Unknown=0, Celebrity=1)	Ad includes a celebrity portraying themselves or a character they're known for. Include musicians playing the ad's music and celebrity voice over.
	Fictional Spokesperson (No=0, Yes=1)	Fictional celebrity spokespersons of the brand, such as Captain Morgan or the most interesting man in the world.
	Gender (Count)	Count of # of male and female characters who are identified as primary in some way (i.e. speaking role, assumed speaking role (miming scenes), member of the focal group even without speaking role, monopolizes a single camera shot even if not a member of the focal group, etc.) Do not use for background individuals (i.e. people in the

		environment who are not featured). Do not count the same character more than once.
	Race (Count)	Count of # of White, Black, Hispanic & Asian characters, same criteria as gender.
Youth-Oriented Theme ^{b d} (absent=0, moderate presence=1, strong presence=2)	Magic (0-2)	Portrayal of actions or events with supernatural or metaphysical properties, e.g. items appearing/disappearing out of the air. Do not use if actions or events are simply unpredictable or unusual.
	Fantasy (0-2)	Setting or theme that does not occur in real life, e.g. in the past or in space. Do not use if setting is simply unusual.
	Violence (0-2)	Portrayal of fighting, weapons, etc., not slapstick violence.
	Humor (0-2)	When the ad is humorous or attempts humor (even unsuccessfully) such as irony, visual humor, slapstick, clownishness, sarcasm, tongue-in-cheek, wordplay, etc. or if a character tells a joke.
	Story Format (0-2)	Is there a story being told? Youths or adults are engaged in actions or activities that directly correspond to the ad's main theme(s). This does not include individuals that simply talk directly to the camera, movement in the background that is incidental to the ad's main point, cartoon character or animal activity, or characters that stand still while the ad's point is conveyed in text, figures, or voice.
Product Appeals ^{b c} (No=1, Yes=0)	Physical Benefits (1-0)	Appeals to physical sensation such as refreshing.
	Health (1-0)	Ad gives health-related information such as calorie content, number of carbs.
	Qualities (1-0)	Any reference to quality, taste, flavor, or perfection.
	Properties (1-0)	Any reference to physical properties of the product like color, texture, lightness, etc.
	Composition (1-0)	Any reference to what goes into the beer such as ingredients.
	Competitive (1-0)	When ad compares the advertised products with other types or brands of alcohol, or uses language to suggest beverage superiority or singularity (i.e. "world's best tasting", "the finest", etc., acknowledging other similar beverages.
	Premium Offers (1-0)	An offer of something additional or bonus with purchase.
	Value (1-0)	Any reference to the financial quality of the purchase, such as money for taste or strength.
Emotional	Mood (0-2)	When ad implies that product is being, is

Appeals ^{b c} (absent=0, moderate presence=1, strong presence=2)		about to be, or could/should be used for relaxation, happiness, having fun, increasing boldness, lessening one's inhibitions, or any other change from basal state.
	Physical Performance (0-2)	When an ad implies that alcohol will have physical improvement effects such as strength, entertainment (better singing), sexual performance, etc.
	Adventure/Spontaneity (0-2)	When ad associates product with personality qualities such as impulsivity, adventurousness, courage or risk-taking.
	Achievement/Success (0-2)	Broad implication of alcohol assisting in goal achievement, including financial, social, athletic, professional, etc.
	Sexual Connotation (0-2)	Ad showing nudity, sexual activity, sexualized actors, lewd or suggestive images or language or when there is a clear implication of a sexual encounter (usually in the future) between models in the ad, between the viewer and another person.
	Romantic Connotation (0-2)	When there is a clear implication of romance, love between models in the ad or between the viewer and another person.
	Individuality (0-2)	Ad has textual reference implying that product is associated with the consumer being his or her own person or taking control of his/her life or aspects of life. Not when ad implies adventurousness, daring (see adventure code).
	Camaraderie (0-2)	When text and images combine to connote friendship, familiarity, closeness with others, as well as party scenes.
	Social Positioning (0-2)	Showing an actor who is a valued member of a group, themes of fitting in, being "popular", impressing others and/or being famous or revered/the upper echelon of society. Also, complimenting, celebrating or otherwise praising others who may have been or may be consuming the beverage.
Risk Content ^e (No=0, Yes=1)	Injury (0-1)	When an activity is depicted which might reasonably be thought to increase risk of injury; includes any type of motor vehicle operation or physical activities requiring alertness or coordination including mountain biking, kayaking, skiing, hiking, jumping into water, etc. by people reasonably considered to be consumers of the beverage. Also, when ad implies that physically risky behavior is expected or encouraged while consuming product.
	Overconsumption (0-1)	When more alcohol is displayed than seems

		appropriate for the number of models in the ad; when one large bottle or many small empty bottles are visually depicted; when whole liquor bottles (full or empty) are shown/being carried by a small group of actors; showing drinking games where the objective or punishment is drinking; when text or images otherwise imply or encourage binge drinking.
	Addiction (0-1)	When ad depicts or refers to consumers drinking alcohol at inappropriate times of day; when ad depicts or refers to excuses for drinking; when ad otherwise implies prolonged consumption over a period of time or dependence on the product.
Industry Codes ^f (No=0, Yes=1)	Santa Claus (0-1)	Any depictions or allusions to Santa Claus
	Branded Kid Items (0-1)	Depictions of logos or other branding on items primarily used by youth, such as toys, games, or children's clothing.
	Rite of Passage (0-1)	Allusions or depictions of alcohol as a "rite of passage" to adulthood.

^a Adapted from Niederdeppe, David, Farrelly & Yarsevich, 2007

^b Adapted from Lewis & Hill, 1998

^c Adapted from Waiters, Treno & Grube, 2001

^d Adapted from Chen, Grube, Bersamin, Waiters & Keefe, 2005

^e Adapted from Rhoades & Jernigan, 2013

^f Adapted from DISCUS & Beer Institute Codes, 2011

Alisa A. Padon
Curriculum Vitae

2219 E. Baltimore St.
Baltimore, MD 21231
alisapadon@gmail.com
(406) 690-1320

EDUCATION

- | | |
|------|--|
| 2014 | PhD, Health, Behavior and Society; Johns Hopkins Bloomberg School of Public Health. Dissertation title: "An Examination of the Role of Advertising Content in Underage Alcohol Consumption." Advisor: Rajiv Rimal, PhD |
| 2008 | MBE, Medical Ethics and Health Policy, University of Pennsylvania |
| 2004 | BA, Psychology, Catholic University of America |

PROFESSIONAL EMPLOYMENT

- | | |
|-----------|--|
| 2008-2010 | University of Pennsylvania, Institutional Review Board, Senior Administrator and Analyst, Human Stem Cell Research Administrator |
| 2007-2008 | University of Pennsylvania, Perelman School of Medicine, Co-Instructor |
| 2007-2008 | University of Pennsylvania, Institutional Review Board, Administrator |
| 2006-2007 | University of Pennsylvania, Institutional Review Board, Administrative Assistant |

RESEARCH EXPERIENCE

- | | |
|-----------|---|
| 2011 - | JHSPH, Center on Alcohol Marketing and Youth; Fellow |
| 2012-2013 | Johns Hopkins Berman Institute of Bioethics; Research Analyst |
| 2011-2012 | JHSPH, Debra Roter Lab; Research Coordinator/Analyst |
| 2011-2012 | JHSPH-UNICEF collaboration; Research Coordinator/Analyst |
| 2004-2006 | University of Pennsylvania, Center for Cognitive Neuroscience; Research Coordinator/Analyst |
| 2003-2004 | Catholic University of America, Cognitive Aging Lab; Research Assistant |

PUBLICATIONS

Refereed Journal Articles

- | | |
|------|--|
| 2013 | Siegel, M., DeJong, W., Naimi, T.S., Fortunato, E.K., Albers, A.B. Heeren, T., Rosenbloom, D.L., Ross, C., Ostroff, J., Rodkin, S., King III, C., Borzekowski, D.L.G., Rimal, R.N., Padon, A.A. , Eck, R.H., & Jernigan, D.H. (2013). Brand-Specific Consumption of Alcohol |
|------|--|

- among Underage Youth in the United States. *Alcoholism: Clinical & Experimental Research*, 37(7): 1195-1203.
- 2011 Gillihan, S.J., Xia, C., **Padon, A.A.**, Heberlein, A.S., Farah, M.J., & Fellows, L.K. (2011). Contrasting Roles for Dorsolateral and Ventromedial Prefrontal Cortex in Transient and Dispositional Affective Experience. *Social Cognitive and Affective Neuroscience*, 6(1): 128-137.
- 2008 Heberlein, A.S., **Padon, A.A.**, Gillihan, S.J., Farah, M.J., & Fellows, L.K. (2008). Ventromedial Frontal Lobe Plays a Critical Role in Facial Emotion Recognition. *Journal of Cognitive Neuroscience*, 20(4), 721-733.

Book chapters

- 2013 **Padon, A.A.** & Rimal, R.N. (2013). The Theory of Normative Social Behavior (TNSB). In T.L. Thompson & J.G. Golson (Eds.), *Encyclopedia of Health Communication* (in press). Thousand Oaks, CA: Sage.
- 2011 **Padon, A.A.** & Baren, J. (2011). Achieving a Decision-Making Triad in Adolescent Sexual Health Care. In T.J. Silber & A. English (Eds.) *Ethical and Legal Issues in adolescent Health Care (AMSTAR)*, 22(2): 183-194.
- 2009 **Padon, A.A.** & Handler, S.D. (2009). "This Won't Hurt a Bit": Truth Telling to Children. In V. Ravitsky, A. Fiester & A.L. Caplan (Eds.) *The Penn Center Guide to Bioethics*. (461-471). New York, NY: Springer Publishing Company.

Manuscripts in Submission

- 2013 Ross, C.S. Maple, E., Siegel, M., DeJong, W., Naimi, T., Ostroff, J., **Padon, A.A.**, Borzekowski, D.L.G., & Jernigan, D.H. (2013). Brand-Specific Exposure to Alcohol Advertising on Television and Alcohol Brand Consumption among Underage Youth. *JAMA Pediatrics*
- 2013 Rimal, R.N., **Padon, A.A.**, Jernigan, D.H., Siegel, M., & DeJong, W. (2013). Normative Beliefs about Alcohol Use among Underage Drinkers in the United States. *Health Education Research*

Manuscripts in Preparation

- 2014 **Padon, A.A.**, Rimal, R.N., Siegel, M., Naimi, T., Ross, C.S. & Jernigan, D.H. The Missing Link in Exposure Research: Targeted Youth Alcohol Advertising.
- 2014 **Padon, A.A.**, Rimal, R.N., Naimi, T. & Jernigan, D.H. Primarily youthful content appeal (PYCA): Alcohol advertising on the Daily Show.
- 2014 **Padon, A.A.**, Rimal, R.N. Siegel, M., Naimi, T. & Jernigan, D.H. Regulating alcohol advertising: Content analysis of the adequacy of industry self-regulation of televised advertisements.
- 2014 **Padon, A.A.**, Rimal, R.N., & Jernigan, D.H. Developing the PYCA index: Exploratory factor analysis of youth-appealing ad content.
- 2013 Jernigan, D.H., **Padon, A.A.**, Ross, C. & Borzekowski, D.L.G. Liking alcohol advertisements: Youth and adult exposure to alcohol marketing on social media.
- 2013 **Padon, A.A.**, Rimal, R.N. & Jernigan, D.H. Creating a normative environment in Facebook: Sharing as a proxy for group approval.
- 2013 **Padon, A.A.** & Rimal, R.N. Brand engagement and the creation of normative beliefs around underage drinking.

AWARDS/HONORS

- 2014 Outstanding Student Poster Award, for “The Daily Show and Youth-Targeted Alcohol Advertising: An Analysis of Primarily Youthful Content Appeal (PYCA)”. American Academy of Health Behavior 14th annual conference, March 16-19; Charleston, SC
- 2013 Doctoral Distinguished Research Award, Department of Health, Behavior and Society, Johns Hopkins School of Public Health
- 2012 Doctoral Special Project Award, Department of Health, Behavior and Society, Johns Hopkins School of Public Health
- 2004 Most Distinguished Psychology Major, Catholic University of America
- 2002 Appointed Cardinal Ambassador, Catholic University of America
- 2001-2004 Dean’s List, Catholic University of America

CONFERENCE PARTICIPATION

Paper Presentations

- 2013 **Padon, A.A.**, Rimal, R.N., Jernigan, D.H., Siegel, M., DeJong, W. (2013). Tapping into Motivations for Drinking among Youth: Normative Beliefs about Alcohol Use among Underage Drinkers in the United States. Paper presentation at the International Communication Association Conference: Challenging Communication Research, London, UK, 17-21 June.
- 2007 **Padon, A.A.** (2007). Duty to Aid. Paper presentation at the Politics and Economics of Global Poverty and Healthcare Conference, Hiram, OH, 21-24 June.

Meeting Presentations

- 2009 **Padon, A.A.** & Joffe, S. (2009). Research involving children or minors: Concepts and values relating to the rights of minors, research with adolescents, and the “Rule of 7”. Prim&R Advancing Ethical Research Conference, Nashville, TN, 14-16 November.

Refereed Abstracts

- 2014 **Padon, A.A.**, Rimal, R.N., Coleclough, L., & Jernigan, D.H. (2013). The Daily Show and Youth-Targeted Alcohol Advertising: An Analysis of Marketing Appeals. American Academy of Health Behavior Conference, Charleston, SC, 16-19 March.
- 2013 Eck, R.H., **Padon, A.A.**, & Jernigan, D.H. (2013). Monitoring Alcohol Marketing: From Measured Media to the Digital Space. Alcohol Policy 16 Conference, Washington, DC, 3-5 April.
- 2013 **Padon, A.A.**, Rimal, R.N. (2013). Beyond Descriptive Norms: The Influence of Youth Injunctive Norms and Expected Outcomes on Drinking Patterns. Alcohol Policy 16 Conference, Washington, DC, 3-5 April.
- 2012 Smith, K.C., Rimal, R.N., Figueroa, M.E., Chatterjee, N., Velu, S., Pongurlekar, S., **Padon, A.A.** (2012). Coverage of HIV in the Indian News Media: What can social discourse reveal about national readiness for youth prevention and education? American Public Health Association meeting, San Francisco, 28-31 October.
- 2006 Xia, C., **Padon, A.A.**, Gillihan, S.J., Heberlein, A.S., Farah, M.J., & Fellows, L.K. (2006). Damage to ventromedial frontal lobe alters affective experience in everyday life. Cognitive Neuroscience Society meeting, San Francisco, 8-11 April.
- 2005 **Padon, A.A.**, Heberlein, A.S., Gillihan, S.J., Farah, M.J., & Fellows, L.K. (2005). Dissociation between emotion recognition and subjective emotional experience in subjects with frontal lobe damage. Cognitive Neuroscience Society meeting, New York, 10-12 April.
- 2005 Gillihan, S.J., Farah, M.J., **Padon, A.A.**, Heberlein, A.S., & Fellows, L.K. (2005). Mood reactivity and recovery in patients with lesions of dorsolateral and ventromedial prefrontal cortex. Cognitive Neuroscience Society meeting, New York, 10-12 April.

TEACHING EXPERIENCE

- 2013 Johns Hopkins School of Public Health. Extended Parallel Process Model (EPPM). Introduction to Persuasive Communication: Theories and Practice. Sole-taught lecture.

- 2012 Johns Hopkins School of Public Health. Principle of Authority. Introduction to Persuasive Communication: Theories and Practice. Co-taught lecture.
- 2009 University of Pennsylvania, Perelman School of Medicine. Ethics of Human Subject Research. Course Co-Instructor.
- 2006-2009 Camden County College. Biomedical Ethics. Adjunct Professor.
- 2007 & 2008 University of Pennsylvania, Perelman School of Medicine. Reproductive Ethics. Course Co-Instructor.

JOURNAL MANUSCRIPT REVIEWS

- 2013 Sexuality Research and Social Policy
- 2012 Journal of Public Health Policy
- 2011 Group Dynamics: Theory, Research and Practice

SOCIETIES and MEMBERSHIP

- 2013- American Academy of Health Behavior Member
- 2012- International Communication Association Member
- 2012- American Public Health Association Member
- 2006- Neuroethics Society Member
- 2004- Phi Beta Kappa Academic Honor Society Member
- 2004- American Society for Bioethics and Humanities Member
- 2004- Pi Gamma Mu Social Science Honor Society Member
- 2004- Cognitive Neuroscience Society Member
- 2002- Psi Chi National Honor Society Member

Other Skills

Certifications: Certified IRB Professional, UPenn Clinical Research Coordinator

Computer: Stata, NVivo, UCINET, Netdraw, E-Prime, Statview, Psyscope, BBEdit, Endnote, Excel, Word, PowerPoint

Operating Systems: Macintosh, Windows

Lab: Electroencephalography (EEG) imaging, EEG hazardous chemicals maintenance, Galvanic skin response (GSR) recording and analysis, Electrocardiogram (EKG) recording and analysis, Transcranial magnetic stimulation (TMS) administration